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Articles

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Combating rotting flesh and putrid smells: the history of antisepsis from antiquity to the nineteenth century

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Abstract

The consequences of serious infections, particularly rotting flesh and putrid smells, have long presented physicians with some of their greatest challenges. Whilst the effective treatment of infectious diseases had to wait until the advent of antibiotics, attempts to prevent infection, and to alleviate some of their most obnoxious effects, have a long history. This article provides a brief overview of the history of antisepsis, from antiquity to the late nineteenth century. The products used progressed slowly from vinegars to stronger acids, hypochlorite solutions, phenol and phenolic surrogates, as ideas about the causes of infection evolved until the eventual elucidation of germ theory.

Zusammenfassung

Die Folgen schwerwiegender Infektionen, insbesondere faulende Fleischwunden von üblem Geruch, haben Ärzte lange Zeit mit einigen ihrer größten Herausforderungen konfrontiert. Während die effektive Behandlung infektiöser Erkrankungen bis zur Einführung der Antibiotika warten musste, haben Versuche Infektionen zu verhindern und einige ihrer schlimmsten Auswirkungen zu lindern eine lange Historie. Dieser Beitrag bringt eine kurze Übersicht über die Geschichte der Antiseptika von der Antike bis zum späten 19. Jahrhundert. Die Mittel, die verwendet wurden, entwickelten sich nach und nach von Essigen zu stärkeren Säuren, Hypochlorit-Lösungen, Phenol und phenolischen Ersatzstoffen, als Vorstellungen über die Ursachen von Infektionen entstanden und schließlich die Keimtheorie zur endgültigen Aufklärung führte.

Introduction

Until very recently physicians had to settle on a diagnosis for a disease without the benefit of any modern medical devices. They had to use all their experience and all of their senses to confirm a particular illness, to assess its progress or regression, and to determine an adequate medical therapy. The word 'diagnosis' is derived from the Greek word διάγνωσις and means 'by exact cognizance', or 'having exact knowledge of'. Before any diagnosis of a disease can be established physicians have always had to speak with the patient about the condition and to observe any symptoms.

In addition, they have had to explore the medical history in detail, and carry out a detailed physical examination if necessary. Today, to ensure a complete and correct diagnosis, medical practitioners normally arrange further checks through laboratory, radiological or ultrasonic investigations before they instruct patients about required therapeutic interventions. Diagnostic procedures are now largely taken for granted.

But in the past far greater emphasis was placed on pastiness, taste and smell, especially with regard to infections. Even today doctors use their eyes and observe the patients´ appearance; they use their ears when auscultating the lung with a stethoscope and their hands when palpating the abdomen. However, the taste and smell senses are now largely considered old-fashioned; sugar in the urine as an obligatory symptom for diabetes mellitus is no longer detected by the tongue, but by diagnostic dipsticks; while infected wounds are categorized as perilous by microbiological methods and not by their foul smell.

In this article we trace the shifting mechanisms by which infection was identified, the gradual evolution of ideas about the causes of infection, and the emergence of agents to control rather than treat infection, from antiquity up to the late nineteenth century. Not until germs were identified as the cause of bad smells and gangrenous injuries could the fatal consequences of infection be properly understood and controlled.

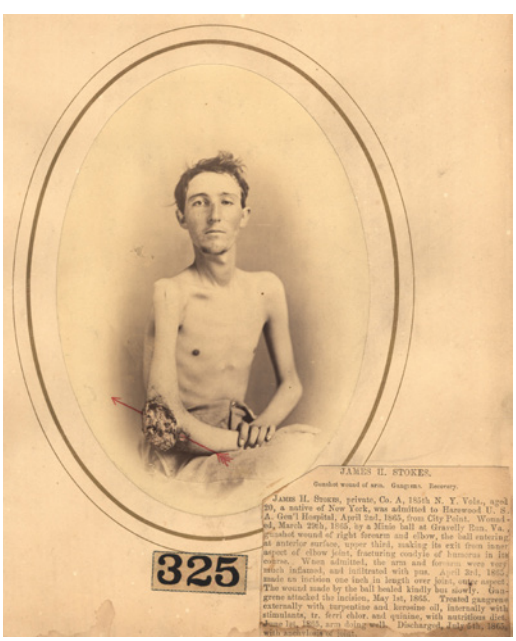

Figure 1. *Gangrenous elbow from a gunshot. 1865, Harewood General Hospital, Washington, D.C. (Source: photograph by R.B. Bontecou. https://collections.nlm.nih.gov/catalog/nlm:nlmuid-101573094-img)*

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Antiquity: putrid smell as an indicator for septic diseases

Physicians of former times had to have a vigilant olfactory sense in order to recognize when the condition of a wound was becoming life-threatening. This was necessary to prevent a rigorous intervention such as an amputation being performed as a last attempt to save a patient's life. In times without any knowledge about bacteria, fungi and viruses it was a common phenomenon for wounds to become infected.

People believed that the occurrence of *pus bonum et laudabile* (good and meritorious pus) was regular, and the effluence of 'morbid humours' was even a pre-condition for initial healing. Pus was held to be a positive sign of self-healing. But when physicians failed to run the purulent wounds dry and the patient fevered intensely, deteriorated and exuded a putrid smell, physicians combated the heating and putrescence of the blood with cooling agents. These might be ingested internally as elixirs, or applied externally in the form of compresses.

The Greek physician Hippocrates (about 460 to 370 BC) taught in his book *On Ulcers* that a wound became purulent as a result of hot and corrupted blood: 'a sore suppurates when the blood is changed and becomes heated; so that becoming putrid, it constitutes the pus of such ulcers'. It can be observed that the words 'sepsis' from the Greek word σῆψις (putrefaction) and 'septicaemia' from the Greek word σήψαιμία (sēpsaimia, putrefaction of the blood) are still in use for a bacteraemia that often occurs with severe and febrile infections.

Hippocrates described methods to fight the infection of wounds. He recommended 'dry treatment of the surrounding parts of the wound with remedies which will prevent suppuration by being desiccant to a certain degree'. For instance, he mentioned leaves of different trees, pomegranate, poley or myrrh, turpentine resin, honey, copper, silver, alum, sour juices, wine and, above all, vinegar.[1]

Vinegar was classified as 'cool and dry' in the ancient humoral theory and was therefore used as an appropriate remedy against feverous infection and suppurating ulcers. Oxymel – prepared from vinegar and honey, sometimes percolated with supplementary herbs – played a prominent role as a remedy and potion. Otherwise infected, red and overheated wounds were medicated with sponges or compresses soaked with vinegar or acetic herbal extracts, in order to cool engorged tissue and to stop putrescence of wounds.[2]

Airs, waters and places as causes of infection

In his work *De Aere, Aquis et Locis* (On Airs, Waters and Places) Hippocrates taught that seasons, temperature, direction of the wind, the position and quality of springs and waters and the humidity of the ground had a great influence on the state of health:

> But if the winter be dry and northerly, and the spring showery and southerly, the summer will necessarily be of a febrile character, and give rise to ophthalmies and dysenteries. For when suffocating heat sets in all of a sudden, while the earth is moistened by the vernal showers, and by the south wind, the heat is necessarily doubled from the earth, which is thus soaked by rain and heated by a burning sun, while, at the same time, men's bellies are not in an orderly state, nor the brain properly dried; for it is impossible, after such a spring, but that the body and its flesh must be loaded with humors, so that very acute fevers will attack all, but especially those of a phlegmatic constitution. Dysenteries are also likely to occur to women and those of a very humid temperament.[3]

Evaporations from marshy lowlands and swamp regions were believed to generate evil and moist air, the morbid *miasma*. Hippocrates supposed a causal relationship between bad environmental impacts and diseases. Corrupt and septic airs, waters and places caused illness, fever and epidemics, especially when the four body hu-

Figure 2. *Ancient Greek pottery: Achilles tending Patroclus wounded by an arrow, identified by inscriptions on the upper part of the vase. Tondo of an Attic red-figure kylix, ca. 500 BC. (Source: from Vulci. Berlin Antikensammlung, Vase F 2278. https://commons.wikimedia.org/wiki/File:Akhilleus_Patroklos_Antikensammlung_Berlin_F2278.jpg)*

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mours (blood, phlegm, black bile and yellow bile) were out of balance.[4]

Hence Hippocrates was looking for causes of fever, ophthalmic infections or dysenteries to get an indication for a subsequent therapy. By propagating natural reasons for sickness he established a new assumption. Until then supernatural theories were widely held and spread in the ancient world. Since divine or demonic influences had been thought to cause diseases and febrile infections were seen as punishment for a crime, people tried to defend themselves by appeasing the annoyed gods with sacrifices and to banish or exorcise demons.

Beginning with Hippocrates people intended to secure themselves against illness by adopting a well-balanced mode of life and elaborating defence strategies against bad environmental influences. The burning of incense and aromatic wood – along with the sniffing at herbs, scented perfume balls and pomanders – was meant to clean corrupt air by means of 'anti-miasmatic' substances. Therefore antiseptic practices, including all those contributing to the prevention of infectious diseases and which today are recognized as anti-bacterial procedures, have their origins in antiquity, with the search for means of dealing with both rotting flesh and putrid smells.

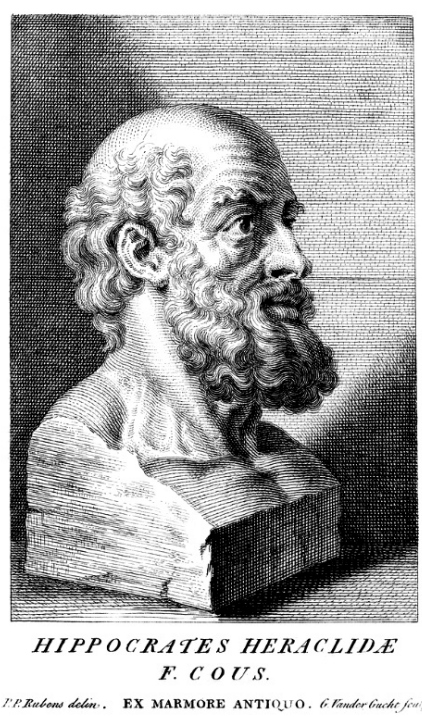

Figure 3. *Hippocrates: On Airs, Waters and Situations (Source: 1734 book by Francis Clifton. http://wellcomeimages.org/indexplus/image/L0041093.html)*

The Middle Ages: contagion as cause of infection

In the Middle Ages the 'Black Death' was a massive and deadly epidemic outbreak of the bubonic plague which spread across Europe between 1347 and 1352. The plague was brought into Europe from the Asiatic Steppes where it had been endemic for a long time. It resulted in the loss of millions of peoples' lives and a drastic reduction of population in the affected areas. Following this epidemic, Europeans experienced recurrent outbreaks of plague over the next four centuries. The humoral theory of miasma or corrupted air causing disease still remained in vogue.

In cases of 'pneumonic plague' the disease was viewed with good cause as being so virulent that nothing else was needed to spread the plague than the very breath of the infected. As already seen in antiquity, prescriptions for prevention of the plague included the regulation of diet to maintain the humoral balance, as well as the burning of aromatic herbs, which was often carried out in public squares to cleanse the air. Other approaches regarding the treatment of the plague advocated keeping the mouth covered, and the sniffing at aromatic herbal preparations while in public places.

At the end of the Middle Ages people were afflicted by syphilis as a new epidemic disease. By that time the Italian humanist physician and poet Girolamo Fracastoro (1478-1553) proposed in 1546 a material cause for contagious and epidemic diseases in his books *De Contagione et contagiosis morbis et eorum curatione, libri III* ('Three books on Contagion and Contagious Diseases and Their Cure'). Tiny imperceptible particles, which he called *seminaria morbis,* were assumed to spread the infection. The suggested seeds were transmitted either by direct contact of an infected person with another person, or by an intermediate object such as clothing, or by contagious particles which were carried by air often over long distances. A forty-day period was introduced as *quarantina di giorni* by authorities, forcing ships from infected places to stay in the harbour before unloading their goods.[5]

Since plague victims were thought to exhale and excrete *seminaria morbis* and to transmit the contagion to other persons by direct contact they were strictly isolated. Possessions of plague victims were destroyed after their death. Medieval doctors used special clothes to protect themselves against the contagion and did not directly touch sick persons. The physicians avoided inhaling 'poisoned air' with the help of a beak-shaped facemask equipped with herbs or vinegar-soaked sponges. People sniffed at flavoured and aromatized preparations like scented perfume balls and pomanders or at rose vinegar filled in perforated boxes.[6]

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Figure 4. *Protective mask against the plague (Source: Deutsches Medizinhistorisches Museum Ingolstadt, Inv.-Nr. 02/222. (Source: photo: Michael Kowalski)*

The early modern period: corruption as cause of infection

The English court physician George Bates (1608-1668) specified *acetum pestilentiale*, prepared with roots from angelica, juniper berries and rue, as a remedy 'pro suffitu, et oris collutione, grassante peste' in the *Pharmacopoeia Bateana*.[7] Therefore vinegar, enriched with essential oil from different drugs, was used for fumigating the mephitic air and for purging the buccal cavity to keep the pestilential contagion from penetrating the body.

In 1720 Richard Mead (1673-1754), a leading English physician, summarized the knowledge of his age about the causes and the prevention of the plague in the compendium *A short Discourse Concerning Pestilential Contagion and the Methods to be used to Prevent it*. Mead regarded miasma, contagion and, above all, 'corruption' as causes for the plague. Likewise, in antiquity and the Middle Ages, the most important strategy remained the prevention of infection, because in most cases curing the plague was impossible. Hence Mead advised the isolation of sick people, avoiding the use of goods like cotton and wool from infected places, and the burning of clothes, feather pillows and other possessions from plague victims, since the 'cloaths of the sick harbour the very quintessence of contagion'.

Moreover, Mead advised people also to keep dead bodies cool until burial, because the decomposition of carcasses deteriorated the air: 'A corrupted State of Air is without doubt necessary to give these Contagious Atoms their full Force'. With reference to Arabic medicine, Mead recommended the cleaning of houses with cooling agents like water and vinegar. He declared: 'Nastiness is a great source of infection, so cleanliness is the greatest Preservative'.

Mead also recalled the advice of Arabian physicians on the repeated use of acid fruits such as pomegranates and lemons, and also the use of vinegar as a preservative against contagious diseases. Wine vinegar, he said, should be rendered with aromatic herbs like 'Gentian Root, Galangal, Zedoary and Juniper Berries'. These ingredients should 'correct the vinegar' and 'take off ill effects upon the stomach'.[8]

Figure 5. *The Company of Undertakers, or a Consultation of Physicians, 1736 by William Hogarth (Source: http://wellcomeimages.org/indexplus/image/M0011548.html)*

Apparently, people followed these hygienic practices with vinegar against rot and corruption as source of infection. Aromatized vinegars like the *acetum antisepticum, vulgo des quatre voleurs* ('vinegar of the four

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thieves') evolved to become very popular remedies of that time. People not only sniffed at it and vaporized it to improve corrupt air and to keep off the plague or other febrile epidemics, but also washed their hands and mouth with it.[9] Doctors sometimes used their 'physician's cane' with a perforated head as 'vinaigrette' or 'pomander stick'. They also sprayed 'Four Thieves Vinegar' around themselves as they travelled and on their clothes to protect themselves against infection.[10]

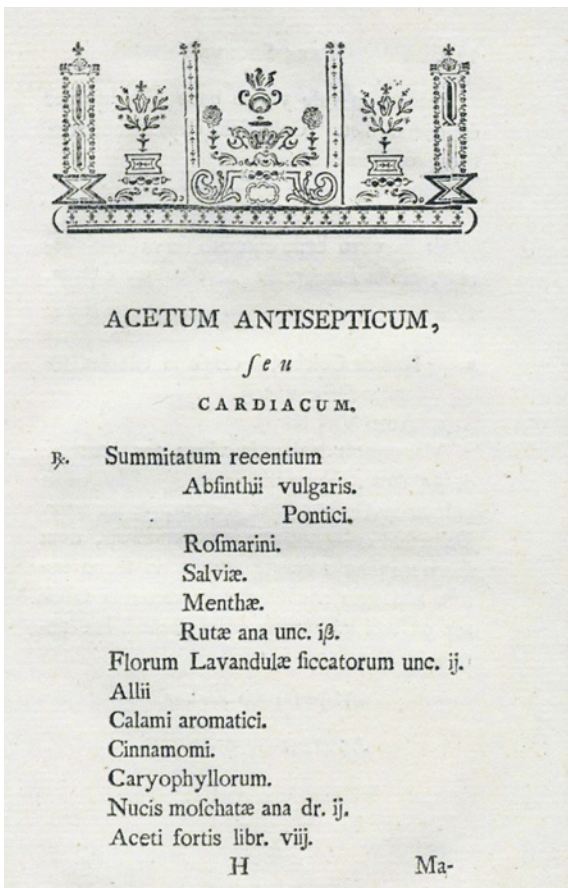
The eighteenth century: the measurement of antiseptic power

In 1752 the Scottish physician Sir John Pringle (1707-1782), the so-called 'father of military hygiene,' edited a textbook entitled *Observations on the Diseases of the Army.* Pringle identified the crowded army camps and hospitals as a major cause of sickness and began to think in terms of septic and antiseptic. He depicted the importance of adequate latrines and proper drainage to stop the 'septic odors' caused by fouling of the ground where hundreds of soldiers lived together under poor conditions and got sick. Between 1750 and 1752 he had communicated in six meetings about his *Experiments upon septic and antiseptic substances, with remarks relating to their use in the theory of medicine* to the Royal Society.[11]

The report about *Experiments upon septic and antiseptic substances* was edited as an appendix in the abovementioned book *Observations on the Diseases of the Army*. Using methodical experiments Pringle examined the effectiveness of different substances against corruption of flesh. Pringle defined a certain amount of sea salt in water as standard and control in comparison with the substances he wanted to examine. Pringle hypothesized that materials that could measurably decelerate or stop the putrefaction of flesh longer than sea salt solution were anti-septic and could prevent infectious diseases caused by putrefactive or septic factors.

Pringle tested different materials, salts and infusions of herbs that he brought in direct contact with standardized pieces of flesh in water. He noted that resinous substances like myrrh, and particularly camphor and herbal infusions from Virginian snake-root, Chamomile flowers, roots of wild Valerian and Jesuit's bark, had demonstrated great 'balsamic virtue' and showed better antiseptic power than neutral salts. He noted that 'acids themselves were amongst the most powerful antiseptics, and that the alkaline salts were likewise of that class' while mixtures of acids and alkalis diminished the antiseptic virtue. Considering the chemical reaction of neutralization this phenomenon is not surprising. In Pringle's 'Table of the comparative power of salts in resisting the putrefaction' Borax, for instance, was 12 times and Alum 30 times as effective as sea salt.[12]

It may be due to Pringle's experiments that in the year 1758 the original name for the 'vinegar of the four thieves', *acetum prophylacticum vulgo des quatre voleurs* – which contained aromatic herbs and camphor – was changed to *acetum anti-septicum vulgo des quatre voleurs*. The importance and popularity of this formulation can be seen through its rapid appearance in European dispensaries. It was published in 1774 in the *Pharmacopoea Austriaco-Provincialis* as *acetum antisepticum seu cardiacum* with the annotation 'Gallis *vinaigre des quatre voleurs* dictum'.



ACETUM ANTISEPTICUM,

ſeu

CARDIACUM.

℞. Summitatum recentium
Abſinthii vulgaris.
Pontici.
Roſmarini.
Salviæ.
Menthæ.
Rutæ ana unc. iß.
Florum Lavandulæ ficcatorum unc. ij.
Allii
Calami aromatici.
Cinnamomi.
Caryophyllorum.
Nucis moſchatæ ana dr. ij.
Aceti fortis libr. viij.

H Ma-

Figure 6. *Acetum Antisepticum. Pharmacopoea Austriaco-Provincialis, Vienna, 1774, p.113.*

Muriatic acid gas and the neutralizing of ammoniacal air

Fifteen years later, in 1789, *aceto antisettico ditto volgarmente dei Quattro ladri* attained recognition by inclusion in the Italian *Ricettario Fiorentino*. Thereafter *acetum aromaticum* was admitted to almost all the European dispensatories and gained great popularity as a preventive agent against epidemics in the nineteenth century. Hence acetic acid as an organic acid and as the active agent of vinegar can be assessed as one of the old-

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est naturally occurring microbicide agents used in combating infectious diseases. Futhermore, people added toilet vinegars with flowery scents to washing water for personal hygiene practice.[13]

John Pringle remained committed to the humoral pathology concept, trying to find *anti-septic* remedies against the assumed *septic* substances causing feverish disease and epidemics. Nonetheless, Pringle's use of the olfactory sense as an indicator of infection, as well as his way of gaining knowledge by methodical experiments and by drawing conclusions, can be interpreted as an important contribution in the implementation of antiseptic substances.

Rotting organic matter produced foul-smelling vapours with sulfides, methane and ammonia gas. The ammonia-rich smell from latrines, sewers, burial grounds and tombs was held to be a dangerous source of infection. Experiments to eliminate this nauseous smell were further important steps in the search for both agents capable of removing foul smells (fumigants) and antiseptic substances respectively.[14]

In the early years of the age of chemical science, foetid vapours had to be destroyed by chemical means. In 1773 the French chemist Guyton de Mourveau (1737-1816) introduced mineral acid as a fumigant to clean and neutralize the air from septic and ammoniacal substances, for instance with volatilized muriatic acid gas (hydrochloric acid) generated by means of the reaction of sodium chloride and sulphuric acid for fumigation against the unbearable odour of decaying corpses and for deactivating contaminated air.[15]

From mortuary to cure: chloride of lime

The French chemist Claude Louis Berthollet (1748-1822) recognized the value of chemical theory in the enhancement of industrial processes and carried out research into dyes and bleaching, being the first to introduce the use of chlorine. He produced a bleaching liquid in his laboratory in Javelle (now Javel) near Paris by passing chlorine gas through a solution of potassium carbonate. The resulting liquid known as *Eau de Javelle* was a solution of potassium hypochlorite.[16]

In the 1820s, the *Société d'Encouragement pour l'Industrie nationale* offered an award of 1,500 Francs for anyone who could develop a non-hazardous method to prepare animal guts (for example, for musical strings) without the usual putrid smell:

> Trouver un procédé chimique ou mécanique pour enlever la membrane muqueuse des intestins traités dans les boyauteries, sans employer la macération et en s'opposant à la putréfaction. Décrire la manière de préparer les boyaux par insufflations.[17]

Figure 7. *Fumigation apparatus for use on ships, impregnating the air, 1806.*
(Source: http://wellcomeimages.org/indexplus/image/L0038431.html)

The French pharmacist Antoine Germain Labarraque (1777-1850) took part in the search and won the award. He had executed experiments with already known bleaching agents and discovered that potassium hypochlorite and calcium hypochlorite (chlorinated lime) – which was produced as a solid bleaching powder by the Scottish factory owner Charles Tennant (1768-1838) – had the desired effect. Furthermore, sodium hypochlorite was shown to have excellent anti-fouling properties.

The preservation of bodily parts without corruption and pestilent stench was not only a hygienic requirement in gut factories but also essential for the preservation of corpses. Consequently *Labarraque's solution* prepared from sodium as well as from calcium hypochlorite offered a very good anti-putrid effect. It was poured over the shrouds of the dead in the mortuaries to avoid corruption until burial. Moreover, it was also used by physicians in dissection and anatomic examinations in forensic medicine.[18]

Even though treatment with alkaline hypochlorite solutions was probably painful and irritated the skin,

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diluted *calcaria chlorata* or *calx chlorinata* was used some years later also in England, Scotland and Ireland as a remedy against 'gangrenous and foul ulcers'.[19] In 1839 the English physician Robley Dunglison (1798-1869) who had moved to America in 1824 to take a professorship in medicine reported about *calcis chloridum* (known alternatively as chloride of lime or Tennant´s Bleaching Powder) as a new remedy, with cross referencing to its medical use in other countries and by other physicians. He illustrated in detail its external application against bad smelling ulcers:

> In this way we found the profuse ichorous secretion from old ulcers diminish, the offensive odour abate, and fresh and healthy granulations spring up. By the same kind of treatment, phagedenic, herpetic, and scrofulous ulcers generally cicatrized speedily and permanently.[20]

Dunglison described different preparations such as 'Collutorium Calcis Chloridi', 'Cataplasma Calcis Chloridi', 'Linimentum Calcis Chloridi' amongst others.

Infection in pregnancy: cadaverous particles

The Hungarian physician Ignaz Philipp Semmelweis (1818-1865) started to work as an obstetrician in Vienna in 1846. The high mortality rate because of puerperal fever in one of the two maternity clinics where Semmelweis and other physicians and students practised was known and feared by the pregnant women. The women sought to give birth in the other maternity clinic where midwives worked and the mortality rate was considerably lower. After the death of his friend and colleague Jakob Kolletschka (1803-1847) Semmelweis became aware that Kolletschka's autopsy report specified a pathology similar to that of women who had died from puerperal fever. Kolletschka had been accidentally wounded with a student's scalpel while performing a post-mortem examination.

Autopsies of deceased women, often conducted before the examination of delivering women, were a routine exercise for physicians and students, but were not practised by midwives. Hence Semmelweis proposed a connection between 'cadaveric contamination' and puerperal fever and concluded that he and the medical students carried 'cadaveric particles' on their hands from the autopsy room directly to the pregnant or delivering maternity patients they examined: 'Ordinary washing with soap is not sufficient to remove all adhering cadaverous particles. This is proven by the cadaverous smell that the hands retain for a longer or shorter time.'

He assumed the resorption of cadaverous particles and their introduction into the vascular system, and predicted that the incidence of puerperal fever could be drastically reduced by washing one's hands with 'chlorine liquida' or solutions from 'chlorinated lime':

> Then if those particles are destroyed chemically, so that in examinations patients are touched by fingers but not by cadaverous particles, the disease must be reduced.[21]

Labarraque's discoveries were essential foundations for Semmelweis's theory and his introduction of hand hygiene practices with *calcaria chlorata* in 1847. However,

Figure 8. *Morgue de Paris, People visiting the morgue in Paris to view the cadavers. 1820s (Source: Lithograph by A. Boblet after Courtrin, Wellcome Library London. https://wellcomeimages.org/indexplus/image/L0042495.html)*

Figure 9. *Ignaz Philipp Semmelweis, 1818-1865 (Source: Semmelweis: Defender of Motherhood, in 'A History of Medicine'. Collection of the University of Michigan Health System, Gift of Pfizer Inc., UMHS.26. Artist: Robert Thom, ca. 1952)*

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they have to be viewed rather as an empirical finding than a substantial contribution to medical progress. Indeed, he could demonstrate the effectiveness of his method by compiling statistics, but he was not able to give evidence about or even to precisely define the nature of his assumed disease-causing 'cadaverous particles'. At that time the germ theory of infection had not been developed and Semmelweis's ideas were contrary to medical practices. Last but not least, physicians refused to adopt the fatal and deathly connection between their activities in autopsies and obstetrical examinations.[22]

From anatomy to cure: aluminium acetate

A further chemical compound which was originally used for preservation of anatomical preparations and corpses eventually led to the implementation of an antiseptic substance which remains in medical use today. The French chemist Jean Nicolas Gannal (1791-1852) was intensively engaged in the search for non-hazardous antiseptic substances to significantly delay the decomposition of dead animals or humans.

He experimented with different chemical compounds and discovered the value of astringent salts aluminum chloride and aluminum acetate for the non-hazardous and effective preservation of corpses in 1835. He demonstrated that corpses could be prevented from decaying by injecting solutions of aluminium salts into one of the carotid arteries. Acetate and chloride of aluminium preserved the dead body with better results and greater economy than other methods like conservation with acids, alcohol or arsenic compounds.[23]

In 1857 the German surgeon Carl August [Heinrich] Burow (1809-1874) referred for the first time to the antiseptic and astringent properties of aluminium acetate solution in the treatment of foul smelling ulcers and other dermatologic diseases. He irrigated and deodorized putrid wounds with favourable results after he had learned from a friend working at a sugar factory that aluminium acetate destroyed the putrid odour of fouling blood that occasionally was used for clearing the sugar juice in the manufacturing process of extracting sugar from beets. Burow observed not only the decrease of putrid smell but also a notable recovery of the suppurating ulcers. In addition he reported the promising application of aluminum acetate solution in other dermatological problems such as mycosis and hyperhidrosis.[24]

Variations of aluminium acetate solution (subsequently named *Liquor Burowi)* remain as elements of many dispensatories and pharmacopoeias today. In Germany the use of the water soluble and solid salt, aluminium acetate-tartrate, continues to increase. This substance was invented and patented in 1883 by the pharmacist Julius Athenstaedt (1842-1914). Athenstaedt's brand *Alsol* (Aluminium-acetico-tartaricum) replaced aluminium acetate solution in German dispensaries.[25] By contrast, a 13% aluminium acetate solution remained in the *British Pharmacopoeia* (BP), and a 5% aluminium acetate solution is still to be found in the *United States Pharmacopeia* (USP).

Solutions made from aluminium acetate or aluminium diacetate (basic aluminium acetate) are often denoted as 'Burow's Solution', and are still used today topically for the rinsing of wounds or for the wetting of compresses. Although they use different concentrations, Burow´s solution is also used in countries such as Japan and South Africa, for instance in the treatment of chronic ear infections often caused by pathogenic and multi-drug resistant micro-organisms. In some European countries including the Netherlands, Switzerland and Germany, aqueous preparations from the solid substance aluminium acetate-tartrate in different concentrations are applied. It has been found to be effective *in vitro* against *Pseudomonas aeruginosa*, Escherichia coli and *Staphylococcus aureus* in concentrations of between 1.25 and 2.5%.[26]

Figure 10. *Glass container for Liquor Alumin. Acet., early 19th century (Source: Deutsches Apotheken-Museum, Heidelberg (Inv.-Nr. II A 1074. Photograph by C. Sachße)*

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Mid-nineteenth century: carbolic acid and salicylic acid

Burow struggled hard for acceptance of his incidental discovery, and often referred to his experience and clearly demonstrated success in the practice of surgery. But in 1857 he still had no plausible theory or explanation for the effect of aluminium acetate solution on septic processes. In contrast the British surgeon Joseph Lister (1827-1912) introduced, some years later, carbolic acid (phenol) in impregnated bandages, which led to a significant reduction in post-operative infection after he had become aware of scientific papers published by the French chemist Louis Pasteur (1822-1895) and could present a scientific theory. Pasteur had demonstrated that fermentation and putrefaction were caused by minute vital organisms suspended in air.[27]

On 21 September 1867 Lister published a paper in the *British Medical Journal* in which he described carbolic acid as an antiseptic substance in its modern meaning as a microbicide agent:

> The material which I have employed is carbolic or phenic acid, a volatile organic compound which appears to exercise a peculiarly destructive influence upon low forms of life, and hence is the most powerful antiseptic with which we are at present acquainted. […]. In conducting the treatment, the first object must be the destruction of any septic germs which may have been introduced into the wound, either at the moment of the accident or during the time which has since elapsed.[28]

He advocated use of a multilayer 'anti-fermentative' dressing as an airtight enclosure for wounds. The carbolized gauze especially should, he suggested, prevent the entrance of 'septic germs' into wounds. Furthermore, Lister atomized carbolic acid (phenol) during surgery to prevent the 'fermentation process' in wounds caused by airborne micro-organisms. However, physicians soon discovered that Lister's carbolic acid-soaked bandage was toxic when used on extensive wounds, and they began to look for similarly effective antiseptic – but more biocompatible – substitutes for soaking bandaging materials and for serving as antiseptic sprays while performing an operation.

The German surgeon Carl Thiersch (1822-1895) had used cotton wool with salicylic acid as a substitute for carbolic acid gauze already in 1874. The chemist Hermann Kolbe (1818-1884), who had found a method to synthesize salicylic acid from carbolic acid and carbon dioxide, had postulated that salicylic acid would destroy micro-organisms by decomposition and release of carbolic acid. Although this is not correct, salicylic acid (also known as ortho- or 2-hydroxybenzoic acid) itself has microbicidal effects.[29]

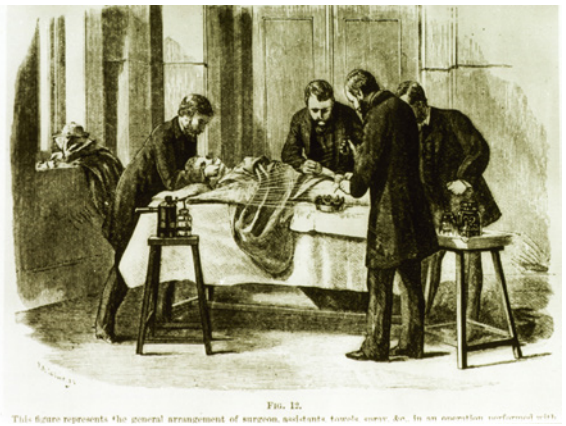

Figure 11. *Operation performed with antiseptic precautions, using Lister carbolic spray (Source: https://collections.nlm.nih.gov/catalog/nlm:nlmuid-101436320-img)*

Late nineteenth century: germ theory

In the end, it was the germ theory of disease that provoked a paradigm shift in the introduction of antiseptic agents and aseptic methods like the sterilization of materials and instruments. Germ theory was developed through scientific work by the French chemist Louis Pasteur, as well as by the German physician Robert Koch (1843-1910). Although today medical bacteriology is based on the admirable work of these two founders of microbiology, they were in practice grim rivals.[30]

In 1915 the English chemist Henry Drysdale Dakin (1880-1952) reported on a sodium hypochlorite solution which he had neutralized with boric acid to avoid

Figure 12. *Carrel-Dakin apparatus (Source: Science Museum, London) (Source: https://www.scienceandsociety.co.uk/results.asp?image=10693225)*

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the 'irritating action of free caustic alkali'. Furthermore, he referred to aromatic chloramines as *Chloramine T* (tosylchloramide natrium) as organic N-chlorinated compound. Dakin offered his services as a chemist during the First World War (1914-1918) to provide wounded soldiers with antiseptics.

In collaboration with the French surgeon Alexis Carrel (1873-1944) the 'Carrel-Dakin method' of wound treatment was generated, which consisted of frequent and intermittent irrigation of wounds with 'Dakin's solution'. This solution was a highly diluted liquid made from sodium hypochlorite and boric acid, and had to be prepared freshly on demand because it was unstable and deteriorated within a short time.[31]

Conclusion

With the beginning of the age of microbiology, substances were described as antiseptic when they could reduce or stop the reproduction of micro-organisms. New aseptic procedures as well as different sterilization methods had to demonstrate their ability to either prevent access to or kill micro-organisms.

It seems that the olfactory sense was of very great assistance in the search for – and successful implementation of – antiseptic substances. Very old antiseptic remedies are preparations of vinegar with the active substance acetic acid. Even today the *WHO model list of essential medicines* presents a 2% solution of acetic acid in alcohol as a suitable medicine for the treatment of ear infections.[32]

Chlorinated lime was used as a disinfectant for water treatment until recently, and N-chloramines are still in use for the treatment of leg ulcers. It liberates small amounts of hypochlorite in water, is only slightly basic, and therefore substantially more biocompatible than solutions made from chlorinated lime.[33]

Nowadays *Burow's solution* – made from aluminium acetate-tartrate – is mostly used as an effective antiseptic ototopic preparation, especially in chronic ear infections caused by multi-drug resistant micro-organisms. The microbicide activity results not only from the aluminium ions but probably mainly from the acid pH value caused by the acetic acid content. So it would be desirable to standardize the acidity of solutions for medical use.

Joseph Lister introduced carbolic acid originally as a substance to destroy 'septic germs' in the air, which he thought were responsible for causing suppuration of wounds. Salicylic acid was expected to be a less toxic *prodrug* and effective surrogate for carbolic acid. In fact it has good antibacterial and antifungal activity as ortho-hydroxybenzoic acid at a low pH-value respectively when it is predominantly undissociated.[34]

In the present era of increasing bacterial resistance against antibiotics, non-antibiotic antiseptics of the past may perhaps be able to provide a back-up for local treatment of infection. Of course, clinical trials will first be necessary to prove their effectiveness and to exclude any undesirable side effects.

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Endnotes and references

1. Francis, A. *The Genuine Works of Hippokrates*. Translated from the Greek. Baltimore, 1939: 333-344.

2. Lang, U. and Anagnostou, S. Vinegar: a traditional vulnerary as a modern topical antiseptic. *Pharmaceutical Historian.* 2011; 41: 54-57.

3. Francis, A. (Note 1) 1939: 29.

4. Francis, A. (Note 1) 1939: 19-42.

5. Byrne, JP. (editor). *Encyclopedia of Pestilence, Pandemics, and Plagues*. Westport: Greenwood Press, 2008: 56-80; 217-218; 584-586.

6. Lang, U. and Anagnostou, S. Aromatic vinegars: antiseptics of the past. *Pharmaceutical Historian.* 2010; 40: 10-12.

7. *Pharmacopoeia Bateana,* altera edition. London, 1691: 1.

8. Mead, R. *A Short Discourse Concerning Pestilential Contagion and the Methods to be used to Prevent it*. Fourth edition. London, printed for Sam. Buckley in Amen Corner, and Ralph Smith at the Royal-Exchange, 1720: 13-23; 47-52.

9. Lang, U. and Anagnostou, S. (Note 6).

10. Silverman ME. The tradition of the gold-headed cane. *Pharos Alpha Omega Alpha Honor Medical Society.* 2007 Winter; 70: 42-46. Also Malloch, A. Other Things – and Pomander Sticks. *The Canadian Medical Association Journal.* 1925; 15: 852-853.

11. Pringle, J. *Observations on the Diseases of the Army in Camp and Garrison.* In Three Parts. With an Appendix containing some Papers of Experiments upon septic and antiseptic substances; with remarks relating to their use in the theory of medicine: in several Papers, read at the Royale Society. Second edition. London, printed for A. Millar; D. Wilson and T. Durham, in the Strand; and T. Payne, next the Mews-gate, near St. Martin´s Church, 1753.

12. Pringle, J. (Note 11): 317-318; 323.

13. Lang, U. and Anagnostou, S. "Wider alle Giffte" – Arzneiessige gestern und heute. *Geschichte der Pharmazie*. 2012; 64: 1-8.

14. Corbin, A. *Pesthauch und Blütenduft. Eine Geschichte des Geruchs*. Translated by Grete Osterwald. Berlin, Verlag Klaus Wagenbach, 1984. Originally published as *Le miasma et la Jonquille. L'odorat et l´imaginaire social XVIIIe –XIXe siècles.* Editions Aubier Montaigne, Paris, 1982. See also Corbin, A. *The Foul and the Fragrant. Odor and the French Social Imagination.* Cambridge, Harvard University Press, 1986.

15. Guyton-Morveau, LB. *Traité des moyens de désinfecter l'air de prevenir la contagion et d'en arrêter les progres*. Second edition. Paris 1802; and Wisniak, J. Louis-Bernard Guyton de Morveau. *Educación Química.* 2003; 14: 180-190.

https://doi.org/10.24355/dbbs.084-202007291151-0

16. Lemay, P. La lessive de Berthollet et l'eau de Javel. *Revue d' histoire de la pharmacie.*1933; 21: 99–103. See also Berthollet, CL. Description du Blanchiment des Toiles et des Fils par l'Acide Muriatique Oxygéné, et de Quelques Autres Propriétés de Cette Liqueur Relatives Aux Arts. *Annales de Chimie.* 1789; Tome 2: 151-190.

17. Bouvet, M. Les grands pharmaciens: Labarraque (1777-1850). *Revue d´histoire de la pharmacie.* 1950; 38: 97-107.

18. Labarraque, AG. *On the Disinfecting Properties of Labarraque's Preparations of Chlorine*. With an appendix of the translator James Scott. Third edition. London: S. Highly, 174 Fleet Street, 1828. See also Labarraque, AG. De l´emploi des chlorures d ´oxide de sodium et de chaux. Paris, Mme. Hazard, 1825.

19. Rennie, J. *A New Supplement to the Latest Pharmacopoeias of London, Edinburgh, Dublin and Paris*. Fourth edition. London: Baldwin and Cradock, 1837: 66-67.

20. Dunglison, R. *New Remedies: The Method of Preparing and Administering them; their Effects on the Healthy and Diseased Economy*. Philadelphia: Lea and Blanchard, 1839: 98-109.

21. Semmelweis, I. *The Etiology, Concept, and Prophylaxis of Childbed Fever*. Translated by K. Codell Carter. Madison: University of Wisconsin Press, 1983: 88-89.

22. Lang, U. Vom Bleichmittel zum Antiseptikum – zur Geschichte des Chlorkalks. *Geschichte der Pharmazie.* 2015; 67: 61-71.

23. Gannal, JN: *History of Embalming, and of Preparations in Anatomy, Pathology, and Natural History*. Translated by Richard Harlan. Philadelphia, Judah Dobson, 1840. Originally published as *Histoire des Embaumements et de la Préparation des Pièces d'Anatomie normale*. Paris: Ferra, Libraire, 1838.

24. Burow, CA: Ueber die Wirkung der Essigsauren Thonerde in verschiedenen Krankheiten. Eine Vorlesung gehalten in der physicalisch-medicinischen Gesellschaft zu Königsberg am 14 März 1857. *Deutsche Klinik. Zeitung für Beobachtungen aus deutschen Kliniken und Krankenhäusern.* 1857; 9: 147-148; 155-158.

25. Lang, U. and Anagnostou S. Essigsaure Tonerde. Obsoletes Hausmittel oder zeitgemäße Arznei? *Geschichte der Pharmazie.* 2013; 65: 59-68.

26. Lang, U. Minimal Inhibitory Concentration of Natural Vinegar and of Aluminium Acetate-Tartrate Solution. *Otology & Neurotology.* 2013; 34: 795-797.

27. Pasteur, L. Recherches sur la putrefaction. *Comptes rendus hebdomadaires des séances de l'Académie des sciences.* 1863; Tome 56: 1189-1194.

28. Lister, J. On the Antiseptic Principle in the Practice of Surgery. *British Medical Journal.* 21 September 1867: 246-248. See also Pasteur, L. and Lister, J.: *Collected Writings*. Foreward by Conrad Fischer. New York: Kaplan, 2008.

29. Lang, U. Salicylsäure und ihr Debüt als Antiseptikum und Konservierungsmittel. *Geschichte der Pharmazie.* 2016; 68: 25-36.

30. Ullmann, A. Pasteur–Koch: Distinctive Ways of Thinking about Infectious Diseases. *Microbe.* 2007; 2: 383-387.

31. Dakin, HD. On the Use of Certain Antiseptic Substances in the Treatment of Infected Wounds. *British Medical Journal.* 28 August 1915: 318-320. Also Dakin, HD. and Cohen, JB. Studies in Antiseptics (II): On Chloramin: its preparation, properties and use. *British Medical Journal.* 29 January 1916: 160-162.

32. *WHO Model List of Essential Medicines.* Twentieth edition, March 2017: 49. Available at: http://www.who.int/medicines/publications/essentialmedicines/20th_EML2017_FINAL_amendedAug2017.pdf?ua=1. Accessed 8 September 2017.

33. Gottardi, W., Debabov, D. and Nagl, M. N-chloramines, a promising class of well-tolerated topical anti-infectives. *Antimicrobial Agents and Chemotherapy.* 2013; 57: 1107-14.

34. Block, SS. (Ed.). *Disinfection, Sterilization, and Preservation*. Fifth edition. Philadelphia, Lippincott Williams & Wilkins, 2001: 263-264. See also Wallhäußer, K. *Praxis der Sterilisation, Desinfektion, Konservierung, Keimdifferenzierung, Betriebshygiene*. Third edition. Stuttgart, New York, Georg Thieme Verlag 1984: 400-401.

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Pharmacists at the Court Pharmacy in Mannheim, Germany, 1721-2017

Georg A Petroianu

Abstract
The Court Pharmacy in Mannheim was established by a decree signed by the Elector Palatine, Carl Philipp, in 1721. It was not the first pharmacy to be established in Mannheim, but with the relocation of the Court from Heidelberg to Mannheim it became one of the most prestigious. While the names of the pharmacists that owned the pharmacy are well known, little is known about most of them. Building on the earlier work of Walter Donat and Wolfgang Caesar, this article sheds further light on the life, families, entourage and social connections of the pharmacists associated with this renowned pharmacy.

Zusammenfassung
Die Hofapotheke in Mannheim wurde per Dekret errichtet, unterzeichnet vom Pfälzischen Kurfürst Karl Philipp im Jahre 1721. Es war nicht die erste Apotheke in Mannheim, wurde jedoch eine der angesehensten Apotheken, nachdem der Kurfürst seine Residenz nach Mannheim verlegt hatte. Die Namen der Besitzer der Apotheke sind wohlbekannt; über ihr Leben weiß man jedoch wenig. Aufbauend auf den Arbeiten von Walter Donat und Wolfgang Caesar, beleuchtet dieser Artikel das Leben, die Familien und Umfeld sowie die Verbindungen der Apotheker, die mit dieser angesehenen Apotheke in Zusammenhang stehen.

Introduction

The County Palatine of the Rhine (later the Electorate of the Palatinate or simply Electoral Palatinate) was a historical territory of the Holy Roman Empire. It was originally a palatinate administered by a count palatine. Its rulers, known as Electors of the Palatinate or Electors Palatine, served as prince-electors. The territory was highly fragmented and stretched from the left bank of the Upper Rhine in what is today the Palatinate region of the German federal state of Rhineland-Palatinate, along with the adjacent parts of the French regions of Alsace and Lorraine, to the opposite territory on the east bank of the Rhine in present-day Hesse and Baden-Württemberg. This area contained the capital cities of Heidelberg and Mannheim.[1]

According to an exclusive privilege ('privilegium exclusivum') issued in 1709 by the then Elector Palatine, Johann Wilhelm (1658-1716), there were to be only four pharmacies in Mannheim: these were the 'Unicorn Pharmacy' (Zum Einhorn), owned by Johann Jacob Zehner, who died in 1728; the 'Black Bear Pharmacy' (Schwarzen Baeren), owned by Herman Rheinhard Ponstein, who died in 1724; the 'Pelican Pharmacy' (Zum Pelikan), owned by Johann Bernhard Mickisch, who died in1749; and the 'Golden Lion Pharmacy' (Zum Goldaenen Loewen) owned by Nicolaus Meder, who died in 1734.[2, 3, 4]

The Elector Palatine, Johann Wilhelm, had no son, and on his death he was succeeded by his brother Carl Philipp, who was born in 1661 in Neuburg. Carl Philipp was then Governor of Tirol in Innsbruck, a position he held between 1707 and May 1717. Upon inheriting the title, Carl Philipp and his Court briefly resided in Neuburg (the city of his birth), staying there until November 1718, before moving to Heidelberg between 1718 and 1719, and then finally to Mannheim in 1720. The choice of Mannheim was an easy one, since Heidelberg Castle was somewhat unappealing after being badly damaged by the French during their occupation. In addition, Heidelberg's Protestant population was not very welcoming to a Catholic Court.

Once in Mannheim, the 'Court Pharmacy' (Die Hofapotheke) was established by another privilege-granting decree signed by the new Elector Palatine, Carl Philipp (1661-1742), on 15 September 1721.[5] It was thus not the first pharmacy to be established in Mannheim, but with the relocation of the Court from Heidelberg to Mannheim it was to become one of the most prestigious. Carl Philipp himself remained in Mannheim for the rest of his life. While the names of the pharmacists who owned the Court Pharmacy are well known, few details are available about most of them. Expanding on the work of Walter Donat (1882-1960) and the more recent work of Wolfgang Caesar (dealing respectively with the pharmacies in Heidelberg and the very early days of the Court Pharmacy in Mannheim) this article aims to shed additional light on the lives, families and social connections of the pharmacists associated with the Court Pharmacy in Mannheim from its origin up to the present day.

The Court Pharmacy has operated from the same location ever since its foundation, apart from a brief interruption between 1943 and 1950. This article presents what is known about the pharmacists who owned the Court Pharmacy in Mannheim over this period. The full list of the owners between 1721 and 2017, with their years of ownership, is presented in Table 1. Periods of ownership were frequently long, but varied between five (August Karl Ball) and 48 years (Martin May).

The Court Pharmacists

1. Sebald Hochschild (1689-1730)

The first owner of the Court Pharmacy was Sebald Hochschild. He was born on 27 November 1689 in

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Table 1. *Owners of the Court Pharmacy, Mannheim C1, 4*, from 1721 to 2017 (C1,4 is an address in Mannheim, see Fig. 2, p. 14.)*

1	1721 - 1730	**Sebald Hochschild** (1689-1730)
2	1731 ~ 1765	**Ferdinand Ba(a)der** (died 1765)
3	1765 - 1788	**Ba(a)der Widow Elisabeth (Kimmel)** (born 1724)
4	1788 - 1812	**Joseph Baader** (1760 - 1812)
5	1812 - 1834	**Baader Widow Katharina (Dachhauer)** (1762 – died circa 1834)
6	1835 - 1868	**Franz Joseph Wahle** (1794 – 1874)
7	1868 - 1884	**Robert Henking** (1838 – 1898)
8	1884 - 1907	**Adolph Hoffmann** (1856 – 1922)
9	1907 - 1912	**August Karl Ball** (1867 – 1923)
10	1911 - 1919	**Alexander Merk** (1876 – 1918)
11	1919 →	**Widow Merk/Erbengemeinschaft** (community of heirs)
12	1950-1957	**Ulrich Merk**
13	1957-2005	**Martin May**
14	2005 → to date	**Thomas Oliver Jürgens**

Eichstaett, Bavaria, and died on Easter Saturday in 1730. He was born to an innkeeper and Council member, Johann Michael Hochschild, and his wife Maria Lucia Arnold of Eichstaett in Bavaria. Starting at the age of ten he was a pupil of the Jesuit College in Eichstaett, which he left in 1705 with the desire to take up pharmacy studies after a while. His marriage in 1718 was registered in the church books of Worms where he resided:

> Sebald Hochschild, court pharmacist, son of Consul Hochschild of Eichstaett, married January 22, 1718 in Frankenthal [the residence of the bride's family] the chaste and pure virgin Maria Magdalena Pflueger [born 1700], the daughter of a merchant from Frankenthal, as witnessed by [his younger brother] Leonhard Hochschild, Licentiate of Both Laws, Common and Canonic.[6]

The same year, in October 1718, with the Court residing in Heidelberg, Hochschild bought the 'White Swan Pharmacy' (Weissen Schwanen) that later became the Court Pharmacy – an honour previously held in Heidelberg by the pharmacy of a physician, Dr. Johann Dietrich Hoffstatt.[7] The likely reason for the change

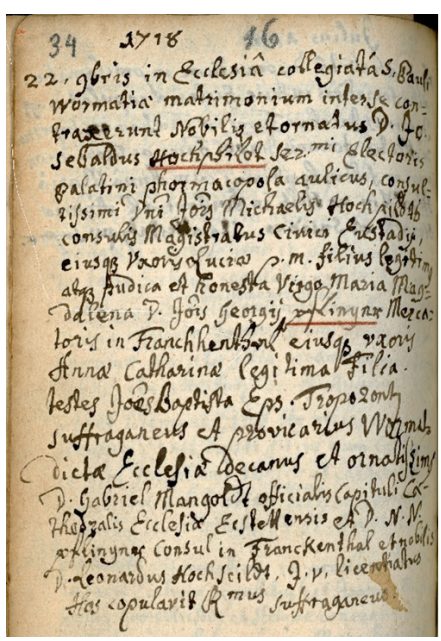

Figure 1. *Sebald Hochschild, Court pharmacist son of Consul Hochschild of Eichstaett married Maria Magdalena Pflueger, the daughter of a merchant from Frankenthal. (Source: Magdalena Kiefel, city archivist, Worms and Jonas Weitz - Institut für Stadtgeschichte, Worms)*

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was Hochschild being both Catholic and Jesuit-trained (as the Elector Palatine was). It is also likely that either Hochschild and/or his relatives were part of the Tirol Governors' administration, and/or of the Neuburg court administration that followed the Elector Palatine, first to Heidelberg and then to Mannheim.

Within the court hierarchy the pharmacist had a fairly high position, only slightly below that of the court physician[8, 9, 10]. Soon after becoming Court pharmacist in Heidelberg the family celebrated the birth of their first child. Franz Johan Carl was baptized in November 1719 in the Catholic Church, Heilig Geist, in Heidelberg. With the Court moving to Mannheim in 1720 Hochschild sold the Heidelberg pharmacy to a Ferdinand Ba(a)der (of whom we shall hear more later).

In Mannheim, the privilege-granting decree that had been signed by Carl Philipp on 15 September 1721 was given to Hochschild. Hochschild is referred to in the decree as Hofapotheker ('Court pharmacist') and following the award of the decree he re-named the pharmacy Die Hofapotheke (the 'Court Pharmacy'). The original German text of the decree has subsequently been reproduced in two German publications; in the magazine *Mannheimer Geschichtsblaetter* (for which the text was provided by pharmacist Adolph Hoffmann, owner of the Court Pharmacy from 1884 to 1904); and in a book by Adlung (who obtained it from pharmacist Karl Fritz Springer, administrator of the Court Pharmacy for the period before 1928).[11, 12]

The Court Pharmacy was located in an area identified as C,1 - the same spot where it can be found today. The city center is laid out in a grid pattern; each quadrant (not necessarily a square) is designated by a letter and a number, hence the address C,1. The system in its present form was introduced 1811.

Sebald Hochschild's other siblings (brother Georg Joseph and sister Maria Anna Lucia) both married in Worms in 1728, his brother to Anna Maria Reinechler of Ladenburg, and his sister to Joannes Michael Haag, keeper of the wine cellar at the Prince Bishops Court in Worms. When Sebald died on Easter Saturday 1730 at the age of 41 he left a widow and two under-age children, Franz Johan Carl and another child whose name is unknown.

2. Ferdinand Ba(a)der (????-1765)

With Sebald's death, ownership of the Court Pharmacy passed to Ferdinand Ba(a)der. We do not know when he was born, as the exact origin of Ba(a)der eluded the author, but we know he died in 1765. However, we know that in Neuburg an der Donau, where the Court resided in 1717, one of the house owners around 1700 was the Court glassmaker, one Johann Ferdinand Bader, who died in 1728).[13] It appears possible that Ferdinand the Court pharmacist was a relative.

With the death of Hochschild the need for a 'Provisor' (or caretaker) to fill the void arose. This opportunity was taken by an old acquaintance, Ferdinand Ba(a)der, the pharmacist who bought the 'White Swan Pharmacy' (Zum Weissen Schwanen) in Heidelberg as Hochschild moved to Mannheim. For Ferdinand there was only a small step from caretaker to family membership and ownership. He married Sebald's widow Maria Magdalena in 1731. Four years later, in 1735, he sold the Heidelberg pharmacy to Johann Caspar Thilo of Weinheim, as the task of running three pharmacies (he then owned ones in Heidelberg, Mannheim and Schwetzingen) was too much. The Court used to spend time not only in Mannheim but also at the Schwetzingen Castle, and the Court pharmacist was required to

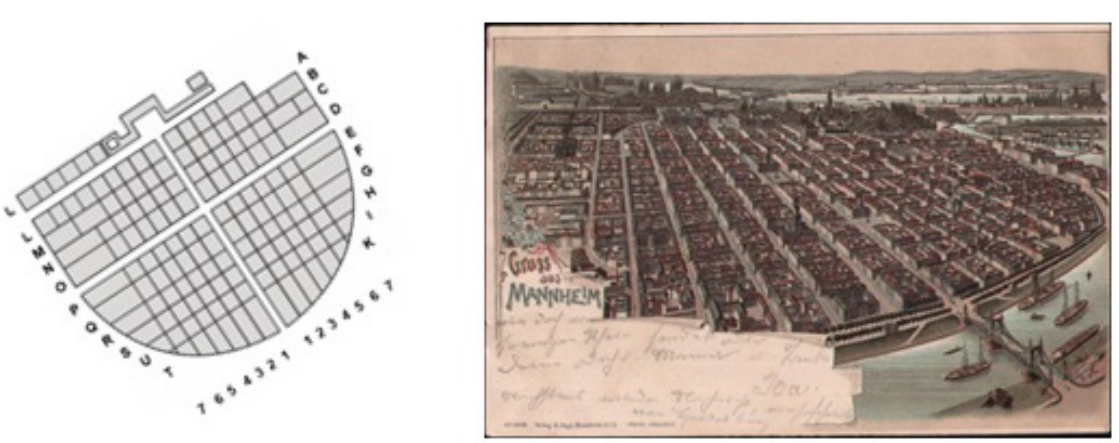

Figure 2. *The postcard stamped 1898 shows Mannheim's grid; the schematic drawing (left) allows orientation. The bridge in the forefront is over the Neckar while in the back one can see the Rhine; Mannheim being located at the confluence of the two rivers. (Source: author's private collection)*

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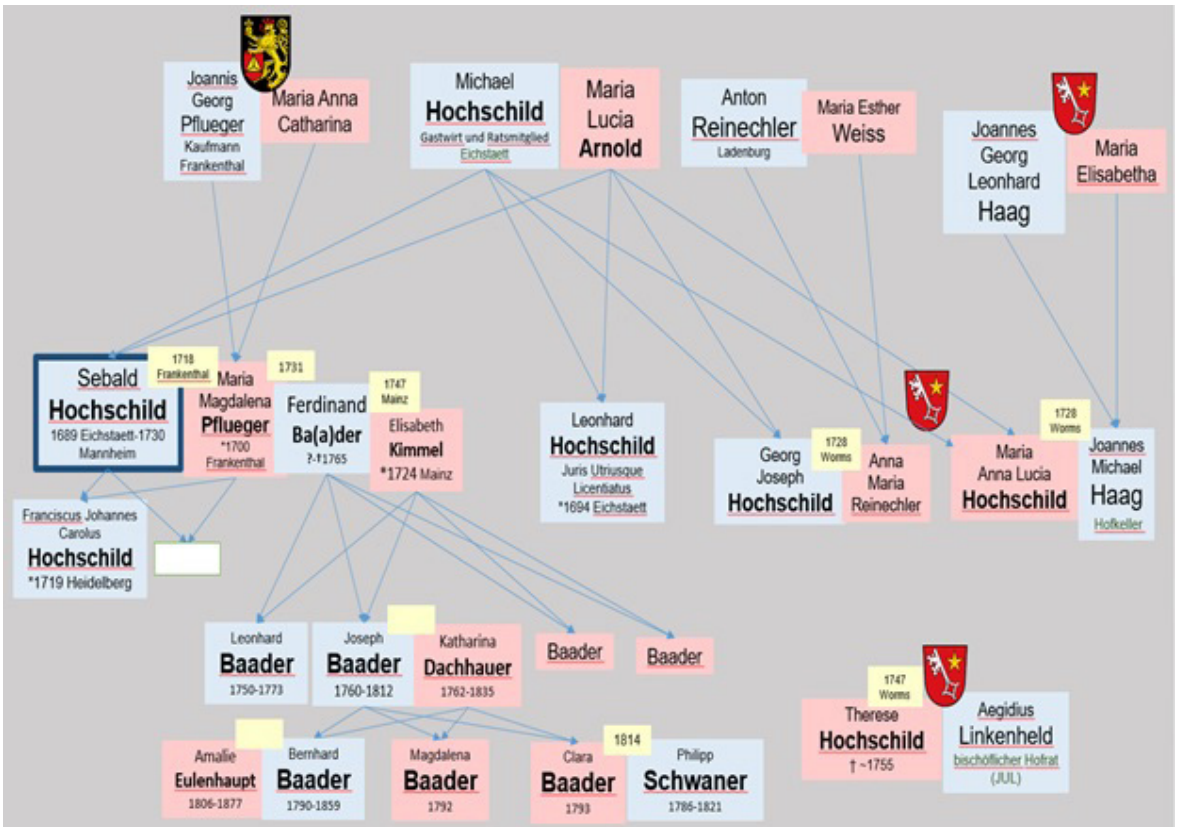


Figure 3. *Hochschild & Baader family tree, highlighting the connections among them.*

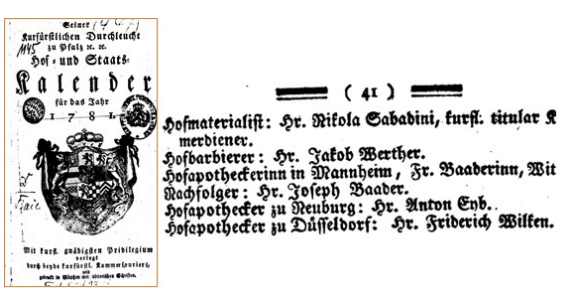
follow the Court and provide services at both locations. The Schwetzingen dependence was located in the corner pavilion of the Marstall, the building where the cavalry was garrisoned.[14, 15]

After the death of his wife Maria Magdalena, Ferdinand married again. In 1747 in Mainz he married Elisabeth Kimmel, who had been born in 1724, the daughter of shoemaker Leonhard Kimmel. She and Ferdinand had four children, including two boys, Leonhard and Joseph.

3. Elisabeth (Kimmel) Ba(a)der (????-1724)

On Ferdinand's death in 1765 ownership of the Court Pharmacy passed to his widow, Elisabeth. Again, caretakers had to be employed. For about two years this role was fulfilled by Franz Werner Bachem (1737-1779) who originated from Linz and was familiar with the pharmacy. He had previously worked there for over two years. When Bachem left the role of caretaker was taken, for over a decade until his death in 1785, by August Manz from Baden-Baden.[16]

Leonhard Ba(a)der, (1750-1773), the eldest son of Ferdinand, was a well-trained pharmacist and a physician, and he had been groomed to take over the Court Pharmacy from his father. He studied in Vienna and Freiburg and received hands-on training not only in his father's pharmacy but also in the pharmacies of Johann Christoph Theophil Neumeyr (or Neumayr), a Court and city pharmacist in Augsburg; at the 'Sun Pharmacy' (Zum Sonne) of Karl Josef Offermann in Vienna, and at the 'Bell Pharmacy' (Zum Glocke) of Johann Nepomuk Keller in Freiburg.[17, 18] However, due to his untimely death ownership had to wait for the younger son Joseph (1760-1812) to qualify before he could succeed. The Court and State Calendar for the year 1781 lists Fr Baaderin, Witwe ('Mr Baader's widow') as the owner of the Mannheim Court Pharmacy, to be succeeded by Mr Joseph Baader (which occurred with some delay in 1788).[19]


Hof- und Staats-
Kalender
für das Jahr
1781

(41)

Hofmaterialist: Hr. Nikola Sabadini, kurfl. titular K merdiener.
Hofbarbierer: Hr. Jakob Werther.
Hofapothekerinn in Mannheim, Fr. Baaderinn, Wit
Nachfolger: Hr. Joseph Baader.
Hofapothecker zu Neuburg: Hr. Anton Enb..
Hofapothecker zu Düsseldorf: Hr. Friderich Wilken.

Figure 4. *Court and State Calendar for the year 1781.*

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The Court Pharmacy during this period was already not only an important local institution but also a significant source of wealth for the owner. Stefan Maerz noted that:

> Medications prescribed by physicians were dispensed to patients (without means) at no charge in the Court Pharmacy. The poor actively made use of this regulation. In 1779, 400 prescriptions were filled which were covered by the state. In the years 1777 to 1786, monthly costs were at 4,300 Gulden on average.[20]

4. Joseph Baader (1760-1812)

Of all the owners of the Court Pharmacy it was Joseph Baader who had the most distinguished career. He was a medical advisor to the Court as well as being the Court pharmacist in Mannheim. He was professor of natural history at the Vereinigtes Großherzogliches Lyceum (high school) in Mannheim, which was newly established in 1807, as well as being the owner of the Court Pharmacy from 1788 until his death. Baader is, however, best known as a leading entomologist of his time, responsible for identifying many insects native to the region, and as the curator of the natural history collection in Mannheim between 1808 and 1812.

Figure 5. *One of the rooms of the natural history collection (Naturalienkabinett) in Mannheim. Reproduced from Kistner 1930*[21]

Joseph married Catharina Dachhauer (1762-1834?) from Hermannstadt (Siebenbuergen), a Saxon city then in the Eastern part of the Austrian Empire. It later became part of Hungary (Nagyszeben), and is now in Romania (Sibiu).[22] His father-in-law, Johann Georg Dachauer, (born around 1708) was a pupil at the Jesuit school in Hermannstadt in 1720, and later became a civil servant there. He married Katharina Marstaller and they had six children, three of whom were girls. When the father died after 32 years of service the family fell on financial hardship.[23]

It is unclear where Joseph Baader and Catharina met. Caesar assumes that Joseph – not unlike his brother – received hands-on training not only in his father's pharmacy but also in pharmacies in foreign lands.[24] Joseph's marriage with Catharina produced a son, Bernhard (born in 1790), and two daughters (Magdalena born in 1792 and Clara born in 1793). Of these only Catharina herself was destined to be a future owner of the Court Pharmacy in Mannheim.

Bernhard Baader (1790-1859) studied law in Heidelberg and became a civil servant. He married in Wertheim Amalie Eulenhaupt (1806-1877), the daugh-

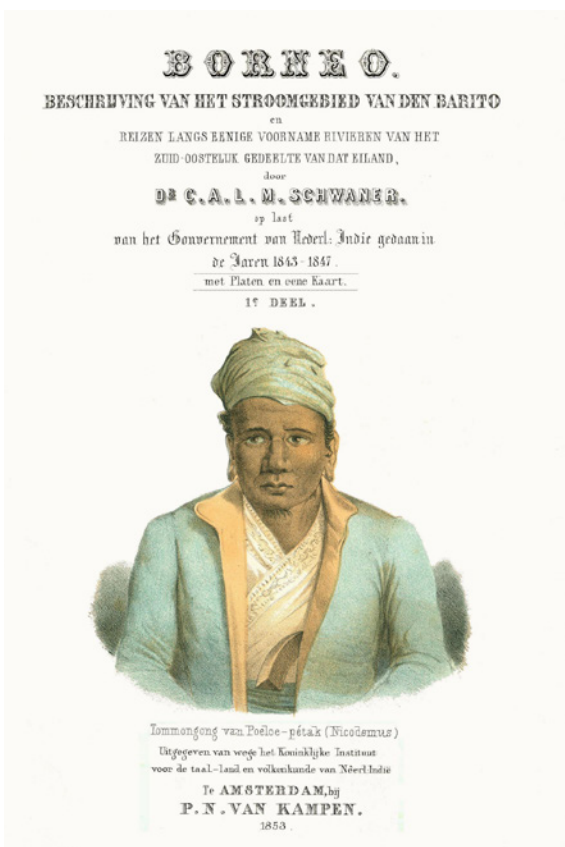

Figure 6. *Book by Dr. Carl Schwaner (1817-1851) explorer of Dutch East India*

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ter of a local judge, Josef Eulenhaupt. Bernhard was a keen collector and publisher of folklore, whilst his wife Amalie was a book author (writing under the pseudonym H. Sales), a newspaper contributor, and most importantly socially engaged, being the founder and benefactor of the Saint Vincentius Hospital in Karlsruhe.[25]

Clara Baader married in 1814 Philipp Schwaner (1786-1821), the son of the priest in Alsbach (Hesse). Philipp studied pharmacy in Giessen and in 1813 purchased the 'Lion Pharmacy' (Loewen Apotheke) in Mannheim. He passed away in 1821 when their son Carl was only four years old. In line with the custom of the time, Bernhard Baader, his uncle, became his foster parent and took responsiblity for his education. Dr Carl Schwaner (1817-1851) is remembered as an explorer of Batavia in the Dutch East Indies (today Jakarta in Indonesia) where he died of disease at a young age. A mountain range in Borneo is named after him.[26]

5. Catharina Baader (1762-1834?)

Upon Joseph Baader's death in 1812 his widow Catharina inherited the title to the Court Pharmacy. She advertised that the pharmacy remained open for business in the local press. It read:

> ....as, after the death of my husband, the professor and Court pharmacist Baader, I continue to operate the pharmacy, and to this purpose I hired an examined administrator that should serve everyone to fullest satisfaction. I make this known to the respected customers, to my highly placed benefactors and friends, and beg for appropriate support.

Badiſches Magazin.

Nr. 186. Montag, den 10. Auguſt 1812.

Mannheim. [Hofapotheke.] Da ich nach dem Tode meines Ehegatten, des Profeſſors und Hofapothekers Baader, meine Offizinal-Geſchäfte fortſetze, und zu deren Betreibung einen geprüften Proviſor aufgeſtellt habe, von dem Jeder zur vollen Zufriedenheit bedienet werden ſoll, ſo mache ich dieſes dem verehrungswürdigen Publikum, meinen hohen Gönnern und Freunden bekannt, und bitte um geneigteſten Zuſpruch.

Mannheim, den 3. Auguſt 1812.

Wittwe K. Baader.

Figure 7. *Upon Joseph Baader's death in 1812 the widow inherited the title to the Court Pharmacy and advertised in the local press*

We have not been able to identify the administrator (Provisor) mentioned. The inheritance was contested by her son-in-law, the pharmacist Philipp Schwaner (died 1821), but Joseph Baader's widow managed to keep ownership of the Court Pharmacy until around 1834, most likely the year she died.

6. Franz Wilhelm Joseph Wahle (1794-1874)

Soon after the death of Catharina Baader the Court Pharmacy was acquired by Franz Wilhelm Joseph Wahle, usually known as Joseph. Wahle was born in 1792 in Geseke, Westphalen, and died in 1874 in Mannheim, Baden. He was the son of Jacob Wahle and Maria Elisabeth Lohmeyer.

The Wahle family can be traced back many generations to Hallenberg, a town close to Marburg in the Hochsauerland region of Westphalia. Franz's grandfather, Johann Jacob (1722-1775) was a saddle maker, who moved in 1752 from Hallenberg to Stadtberge (now Marsberg); it was there that Jacob, Franz's father, was born in 1763. Franz's mother, Maria Elisabeth, was most likely the daughter of Franz Joseph Lohmeyer and the widow of Caspar Niermann, a feudal vassal of the noble canonesses diocese of St Cyriakus.[27]

Franz's parents, Jacob and Maria Elisabeth, were married in October 1787 in the St. Cyriakus diocese church in Geseke, where they resided. Their first child, a daughter Clara, was born in 1789, whilst Franz Wilhelm Joseph followed in 1792. His godfather was Franz Wilhelm Mues, the local judge appointed by the ruler, the Archbishop of Cologne. The Mues family were a prominent local dynasty; Joseph Clemens Mues, the father of the judge, was a judge himself, having previously been the judge in Geseke.[28]

Joseph Wahle was a court councillor, and was the owner of the Court Pharmacy in Mannheim for a total of 33 years, from 1835 until 1868. Very few details about him are known to the author, except that he was single, affluent and a keen art collector. In his collection were over 450 paintings and over 100 statues. All were sold at auction by his heirs on his death at the age of 82. The importance of his art collection can be gauged from the fact that a travel guide for Mannheim, Heidelberg and Schwetzingen published in 1843 in Heidelberg by a certain Franz Baader recommended a visit to the collection of the Court pharmacist Wahlé (spelled with é), which contained very nice old German paintings.[29] In addition, he pointed out that Wahlé also owned a very large and complete collection of both indigenous and exotic plants.

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Upon his death in 1874 the authorities were notified by the then 26 year-old Ernst Seeger, who lived in the same household. Seeger hailed from Oehringen (Wuerttemberg) and his father, Philipp Ludwig (1803-1874) must have been well acquainted with Wahle. Ernst Seeger (1848-1929) was not only a wealthy and successful merchant and furniture manufacturer but also an avid art collector and generous supporter of the German realist painter Wilhelm Leibl (1844-1900).

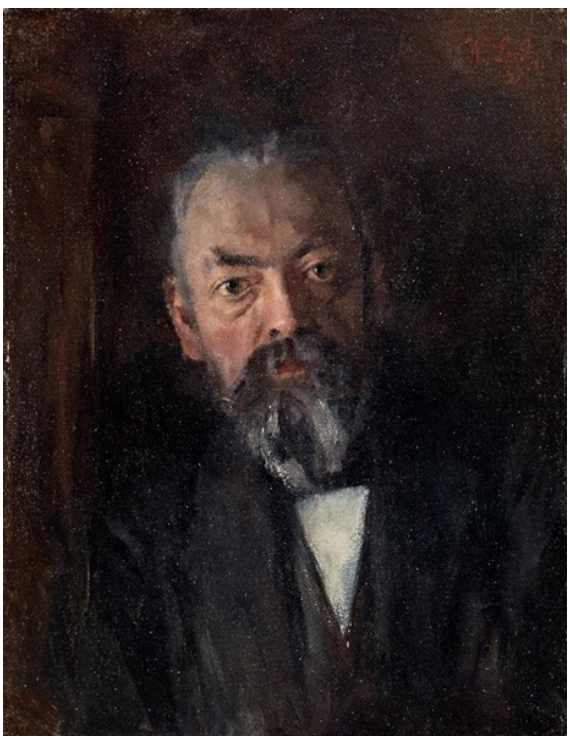


Figure 8. *Portrait of Counsellor of Commerce Ernst Seeger by Wilhelm Leibl (1844-1900), Kunsthalle, Bremen, in 1899 (Source: Reproduced with kind permission of © Kunsthalle Bremen - Karen Blindow – ARTOTHEK).*

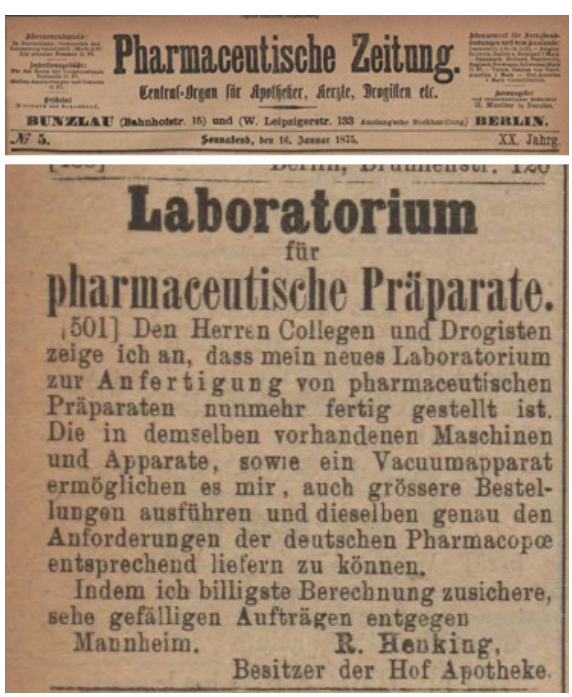
7. Robert Henking (1838-1898)

Joseph Wahle disposed of the Court Pharmacy in 1868, six years before his death. It was acquired by Robert Henking, who retained it for 16 years. Henking hailed from a large, affluent and well-connected dynasty, related to the Delph family. Helene Dorothea Delph (1728-1808), a friend of Goethe's mother (Katharina Elisabeth Textor), played a major role in supporting the Henking children, especially after the early death of Johann Heinrich Henking (1751-1798), Robert's great grand-father, who was the owner of the Court Pharmacy in Heidelberg. Around 1800, Johann Heinrich's son Ferdinand (1784-1834) secured – with Johann Wolfgang von Goethe's (1749-1832) help – a training position in Erfurt with the most famous pharmacist of his time, Johann Bartholomäus Trommsdorff (1770-1837).[30, 31]

After his apprenticeship in Erfurt Ferdinand inherited the Court Pharmacy in Heidelberg, and he was followed by his son Eduard (1807-1880). Robert (the owner of the Court Pharmacy in Mannheim from 1870 to 1884) was Eduard's' son with Sophie Alvina Wolf, who was born in 1819 and died in Freinsheim in 1907. Robert married, first in 1866 in Heidelberg, Anna Landfried (1846-1867), and then, after her death in 1869, her younger sister Franziska Elisabeth Landfried (born 1848). The couple had two children; Mathilde, born in 1871 who died very young, and Eduard, born in 1874. Eduard married Bertha Emilie Thorlete in 1902. Robert's father-in-law, Friedrich Landfried (1813-1894) was a tobacco grower and cigar manufacturer who played a major role in establishing the tobacco industry in the Palatinate.[32]

In Mannheim Robert co-established, with Dr Carl Bissinger (1847-1904), the Mannheimer Chemisches Laboratorium, an analytical chemistry laboratory. In the January 1875 issue of the *Pharmaceutische Zeitung* Henking announces

> …to colleagues and drug-store owners that [his] new laboratory for the manufacture of pharmaceutical products is completed. The machinery as well as a vacuum device allow for the production and delivery



Pharmaceutische Zeitung.

Central-Organ für Apotheker, Aerzte, Drogisten etc.

BUNZLAU (Bahnhofstr. 16) und (W. Leipzigerstr. 133 Ausliefer. Buchhandlung) BERLIN.

№ 5. Sonnabend, den 16. Januar 1875. XX. Jahrg.

Laboratorium

für

pharmaceutische Präparate.

[501] Den Herren Collegen und Drogisten zeige ich an, dass mein neues Laboratorium zur Anfertigung von pharmaceutischen Präparaten nunmehr fertig gestellt ist. Die in demselben vorhandenen Maschinen und Apparate, sowie ein Vacuumapparat ermöglichen es mir, auch grössere Bestellungen ausführen und dieselben genau den Anforderungen der deutschen Pharmacopœ entsprechend liefern zu können.

Indem ich billigste Berechnung zusichere, sehe gefälligen Aufträgen entgegen

Mannheim. R. Henking,

Besitzer der Hof Apotheke.

Figure 9. *January 1875 issue of the Pharmaceutische Zeitung*

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> of large quantities of orders while maintaining the [high] standards of German pharmaceuticals. [He is] looking forward to your kind order and guarantee cheapest prices.

Carl, his partner, was the son of pharmacist Ludwig Bissinger (1809-1881), the owner of the 'Pelican Pharmacy' (Zum Pelikan) in Mannheim between 1863 and 1873, and brother-in-law of lawyer and politician Alexander von Soiron (1806-1855). He was also vice president of the Frankfurt Parliament in 1848.[33] Despite his professional and business interests in Mannheim, Robert continued to reside in Heidelberg. The house he commissioned there shortly before his death in 1897, situated in Rorbacher Street 78, survived the war. His widow resided in the house until 1928. The house is nowadays the headquarters of a corporation.

8. Adolph Hoffmann (1856-1922)

Robert Henking disposed of the Court Pharmacy in Mannheim in 1884, when it was acquired by Adolf Hoffmann, who retained it for 23 years until 1907. The Hoffman family lineage is well-documented, starting with Antonius (1613-1671) from Wolfskehlen, in Hesse. His son was Pastor Hermann Andreas (1656-1742), whose own son was Auditeur Johann Christian (1684-1726). Next came Christian Gerhard (1713-1747), who in turn produced Amtsmann Hermann (1740-1800). Hermann was the father of Ökonom Wilhelm (1771-1847), the grandfather of Adolf Hoffmann.

Wilhelm originated from Grebenstein near Hofgeismar in the state of Hesse.[34] Ökonom is an old German term describing people leasing and working that land. Eventually Wilhelm accumulated some wealth, allowing him to purchase property in Wehlheiden and to become a land owner. After his first wife Marie Elise Herbold passed away in 1810, Wilhelm married again in 1812, his second wife being Louise Herbold (1791-1852). The couple settled in Marburg on the Lahn (Hesse).

There he successfully engaged in property speculation. He managed to buy two large properties nationalized by the German state in the process of secularization, and he quickly sold parts of them at a profit. He achieved national notoriety and constitutional history relevance as he successfully appealed to the Federal Assembly in Frankfurt against an eviction decision issued by the principality of Hesse after the restitution.[35] The story of the Hoffmann Affair and its outcome is superbly related in great detail by Seier.[36]

Wilhelm's children inherited a large fortune, his son Friedrich – most likely the first born – being in those days the richest man in Marburg.[37] Another son, Eduard (1824-1909) entered politics and was elected as a member of the Parliament of Hesse-Nassau. Eduard's daughter married the renowned surgeon Ludwig Rehn (1849-1930), the first physician to recognize the connection between aniline (phenylamine) exposure and bladder carcinomas, as well as the first surgeon to successfully repair – by means of a suture – a laceration of the human heart.[38, 39]

A further son was the pharmacist Dr Louis Hoffmann. He was born in 1828 in Marburg and died in 1876 in Wiesbaden. He took his pharmacy examinations in 1855, and became the owner of the prestigious 'Deer Pharmacy' (Hirschapotheke) in Wiesbaden. He purchased this in 1856 from pharmacist and chemist Emil Erlenmeyer (1825-1909), who was world-renowned as the creator of the flask bearing his name. Louis married Luise Bücking (1831-1902), the daughter of the merchant Christian Bücking, and the couple had a son Adolph, soon to become the future Court pharmacist in Mannheim.

Adolph married Amalie Hermann (born in 1866 in Kehl) and the couple had six children in Mannheim. Hoffmann owned the Court Pharmacy in Mannheim from 1884 until 1907, and was awarded in 1904 the title of 'Court Pharmacist' (Grossherzoglicher Badischer Hofapotheker). The family moved back to Wiesbaden in 1910, most likely after Amalie's death. There, Adolph passed away in 1922 in his residence on the third floor at Kaiser-Friedrich-Ring 5 (the superb edifice designed by the architect Karl Schultze and built in 1895 survived the Second World War). The death was reported to the authorities by his daughter Elisabeth (born in 1893), who was a midwife.

9. August Karl Ball (1867-1923)

Adolf Hoffmann disposed of the Court Pharmacy in 1907, when it was acquired by August Karl Ball, who retained it for just five years, its shortest period of ownership. August's father Heinrich was a civil servant in charge of the forestry administration. During this tenure he was stationed at various locations around Germany, where his children were born. At Tiefenbach/Wolfstein, his wife gave birth to their son Joseph in 1856, a daughter Joanna in 1857, and another son Bernhard in 1860. At Dahn, she produced a second daughter Elisabetha in 1861, and at Eppenbrunn by Pirmasens a third son August Karl, born in 1867. Finally, in Thaleischweiler (Zweibrücken), she produced another daughter Christina, who sadly died in 1892.

Both Bernhard (1860-1935) and August Karl become pharmacists: while Bernhard owned the Adler Pharmacy in Ludwigshafen from 1914 until his death in 1935, August Karl owned in rapid succession a num-

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ber of pharmacies: firstly, one in Lohr between 1895 and 1897; then one in Mellrichstadt between 1998 and 1904; and then the 'Swan Pharmacy' (Schwanen Apotheke) in Erlangen from 1904 until 1906. He bought the Court Pharmacy in Mannheim in 1907, selling it in 1912 to buy the 'Fish Fountain Pharmacy' (Fischbrunnen-Apotheke) in Esslingen, which he ran from 1912 until 1921.[40]

August married Elise Lutz, the daughter of a prominent architect from the University of Wuerzburg, Georg Lutz, who died in 1885. A son, Otto, also became a pharmacist, and together with his wife Eugenie Bruer became a manufacturer of pharmaceutical and dietetic products, with somewhat uncertain success. Heinrich Ball's children and those of his brother Karl Ball (1849-1929), a shoe manufacturer and leather merchant from Pirmasens, were cousins. So the Court pharmacist in Mannheim at this time was the cousin of Hugo Rudolf Ball (born in 1886 in Pirmasens and died in 1927 in Switzerland) who was a prominent founder of the Dadaist movement.

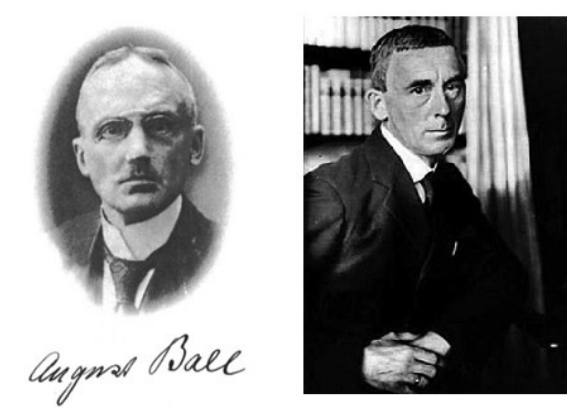

Figure 10. *August Karl Ball (1867-1923) Reproduced with kind permission of Rosie & Dr. Karl-Heinz Bartels †, Marien-Apotheke in der Schneewittchenstadt Lohr am Main and (right) Hugo Rudolf Ball (1886 – 1927) (Anonymous, 1916).*

10. Alexander Otto Emil Merk (1876-1918)

The next owner of the Court Pharmacy at Mannheim was Alexander Otto Emil Merk. His grandfather Alexander Merk was a Royal Commissary, and then for many years until his retirement from the civil service in 1887 he was the appointed mayor of Dolzig, then in Prussia. His son Rechnungsrath Alexander Ernst Gustav Merk was born in 1849 in Sprottau (Prussia), and married Emma Froschauer, born in 1855. Their son was to become the pharmacist Alexander Otto Emil Merk. He passed the pharmacy examination in 1904 in Giessen (Hesse), and then owned and operated the Court Pharmacy in Mannheim from 1911 until his early death in 1918.

In the November 1912 issue of the *Pharmazeutische Zeitschrift* a brief notice reprinted from the *Neue Badische Landeszeitung* describes the substantial reconstruction and redesign of the Court Pharmacy undertaken subsequent to the change in ownership. In charge of the planning and execution was the architecture office of Friedrich Marx (1885-1975) and Georg Wagner in Mannheim (L2, 12). They are not to be mistaken for the better known Darmstadt (Hesse) professors of architecture and privy councillors Erwin Marx (1841-1901) and Heinrich Wagner (1834-1897).

> …..The 190 year-old Court Pharmacy received a total makeover and redesign……The distinguished owner Mr. Alexander Merk has displayed an elegant and distinguished taste. With support from the architecture bureau of Marx & Wagner, he has created a shop that is unprecedented in Germany. From the early court pharmacy, he has built an exemplary modern pharmacy, all by respecting the strict administrative provisions. In Mannheim, other official buildings and institutions have become a model in terms of taste and fulfillment of health requirements, so we are pleased to see that our home city of Mannheim will also be taking on a leading role in modern apothecary.

Figure 12. *Entrance to the Court Pharmacy as seen on a photograph from the 1920s (Source: Stadtarchiv Mannheim [May, Martin (Hofapotheke), 1925-1927]*

Alexander Merk married Margaretha Luise Link (1891-1969); both their children, a son Ulrich Alexander Edmund (born in 1914) and a daughter Renate Helene Cnyrim (born in 1916 and died in 2014), became pharmacists. Ulrich re-opened the Court Pharmacy in 1950, as it had ceased operation due to war damage around autumn 1943, while Renate became the owner in 1953 of the 'Roland Pharmacy' in Mannheim.

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11. Recent history of the Court Pharmacy (1919-2017)

After Alexander's death in 1918 the heritage community (Erbengemeinschaft) took over the Court Pharmacy on behalf of Merk's widow in order to ensure its survival. Over the next few years it continued to operate as a pharmacy and employed a number of pharmacists as its administrators. The names of some of the people employed are known, although the list is most likely incomplete. They included Fritz Karl Springer from Oberwiesa in Saxony, who took his pharmacy examination in 1902, and was administrator until 1927.

Alexander Merk's widow re-married in 1928; her second husband was a pharmacist, Emil Querfurt from Dortmund. He was the son of Heinrich and Katharine Querfurt nee Berndsmann, and was born in 1886. Emil Querfurt took his pharmacy examination in 1912 in Kiel, and administered the Court Pharmacy in Mannheim until 1932.

After the break in continuity imposed by the Second World War the Court Pharmacy was re-opened in 1950 by Ulrich Alexander Edmund Merk, the son of Alexander Merk and his wife Margaretha Luise Link, who became its twelfth owner. Ulrich remained its owner for seven years until 1957, at which time he was the last member of the Merk family to own the pharmacy. It was then bought by Martin May, who became its thirteenth owner and retained it for 48 years, until 2005. In that year it was acquired by the present owner, Thomas Oliver Jürgens, who continues to be its proprietor today.

Conclusion

The aim of this work has been to provide readers with a comprehensive source of information and historical detail concerning the owners of the Court Pharmacy in Mannheim over the last three centuries or so, offering not only biographical information but also shedding some additional light on their families, social context and interests beyond the art of the apothecary. The hope is that with the information provided more cognizant scholars will be empowered to identify patterns and draw their own conclusions, going beyond the mere destinies of the individuals mentioned.

The Mannheim Court pharmacists – especially the early ones – had not only to be well-trained, but they also had to be well-connected and have the right 'confession', or religious affiliation. These requirements overlap to a certain degree, as connections were established mainly by sharing schooling as provided by the Jesuits.

With the transition of Mannheim to the more liberal Grand Duchy of Baden, financial power became the common denominator of the Court pharmacists. The owners could pursue other interests in addition to (or maybe instead of) their duties as pharmacists, be it fine arts collections (Wahle) or analytical chemistry (Henking). Whether these attempts at generalization hold up or not, the fact is that many members of the families of Court pharmacists played significant and worthy roles in German (especially Baader and Hoffmann), or even European (Ball) history, and their lives and contributions are deserving of greater attention by pharmaceutical historians.

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Endnotes and References

1. Kohnle, Armin. *'Mittelalterliche Grundlagen; Pfalzgraftenamt, Territorialentwicklung und Kurwürde'. Kleine Geschichte der Kurpfalz. Regionalgeschichte-fundiert und kompakt.* First edn. Karlsruhe: G. Braun Buchverlag. 2005: 17.
2. Von Feder, H. *Geschichte der Stadt Mannheim XVII und XVIII Jahrhundert*. Mannheim & Strassburg: Verlag von J Bensheimer, 1875: 378.
3. Anonymous. Zur Geschichte der Mannheimer Apotheken. *Mannheimer Geschichtsblätter* 1900; 12: 265-266.
4. Walter, F. *Geschichte Mannheims von den ersten Anfaengen bis zum Uebergang an Baden (1802)*. Mannheim: Verlag der Stadtgemeinde, 1907: 612.
5. Anonymous. Zur Geschichte der Mannheimer Apotheken. *Mannheimer Geschichtsblätter* 1900; 11: 238-240.
6. Church books (Kirchenbuch St. Paul I) of Worms, Rhineland-Palatinate, Germany, 1718.
7. Donat, W. *Die Geschichte der Heidelberger Apotheken. Neues Archiv für die Geschichte der Stadt Heidelberg und der Rheinischen Pfalz*. Heidelberg: G. Koester, 1913; 10: 65-196.
8. Anonymous. *Mannheimer Geschichtsblätter.* (Note 2) 1900: 265-266.
9. Haas, R. and Probst, H. *Die Pfalz am Rhein: 2000 Jahre Landes-, Kultur- und Wirtschaftsgeschichte*. Palatinate: Südwestdeutsche Verlagsanstalt, 1984: 1-240.

https://doi.org/10.24355/dbbs.084-202007291151-0

10. Caesar, Wolfgang. Mannheimer Apotheker kurpfaelzischer Zeit. *Mannheimer Hefte* 1989; 2: 88-97.

11. Anonymous. *Mannheimer Geschichtsblätter.* (Note 2) 1900: 265-266.

12. Adlung, A. *Die Apothekenbesitzrechte in den deutschen Laendern*. Berlin: Verlag Julius Springer, 1927: 4.

13. Adam, K. *Häuserbuch Neuburg an der Donau Stadtviertel B Stadtarchiv Neuburg an der Donau*. Ostseite: Wolfgang-Wilhelm-Platz, 2013: 162-173.

14. Donat, W. *Die Geschichte der Heidelberger Apotheken*. (Note 6) 1913: 65-196.

15. Caesar, Wolfgang. *Mannheimer Hefte.* (Note 9) 1989: 88-97.

16. Caesar, Wolfgang. *Mannheimer Hefte.* (Note 9) 1989: 88-97.

17. Donat, W. *Die Geschichte der Heidelberger Apotheken*. (Note 6) 1913: 65-196.

18. Caesar, Wolfgang. *Mannheimer Hefte.* (Note 9) 1989: 88-97.

19. Anonymous. *Seiner Churfürstlichen Durchleucht zu Pfalz Hof- und Staats-Kalender*. Muenchen: Franz, 1781.

20. Maerz, S. Glanz der Residenz zur Karl-Theodor-Zeit. In Caroli Michael & Ness Ulrich (eds). *Geschichte der Stadt Mannheim*. Ubstadt-Weiher: verlag regionalkultur, 2007: 3.

21. Kistner, A. *Die Pflege der Naturwissenschaften in Mannheim zur Zeit Karl Theodors*. Mannheim: Selbstverlag des Mannheimer Altertumsvereins, 1930.

22. Caesar, Wolfgang. *Mannheimer Hefte.* (Note 9) 1989: 88-97.

23. Olga Khavanova: A kérelemírás mestersége és hivatalnoki pályafutások a XVIII. századi Habsburg Monarchiában. *Századok* 2008; 142(5): 1249-1266.

24. Caesar, Wolfgang. *Mannheimer Hefte.* (Note 9) 1989: 88-97.

25. Anonymous. Amalie Baader. In von Weech F (ed). *Badische Biographien.* Braun: Karlsruhe, 1881; 3: 7-11.

26. Maesel, Markus A.: Ein Mannheimer in Indonesien: Der Naturforscher Dr. Schwaner (1817-1851). *Weltgefluster Notizen am Wegesrand,* 2009: 1-6.

27. Stuempel, M. *Familienbuch nach den Eintragungen in den Pfarregistern der Stiftskrche St. Cyriakus in Geseke*. Geseke: Verein fuer Heimatkunde Geseke, 1996.

28. Richter, E. *Geschichte des Stadtarchivs Geseke und seiner Bestände. Texte und Untersuchungen zur Archivpflege herausgegeben von Norbert Reimann*. Münster: Westfälisches Archivamt, 2004; 17.

29. Baader, F. & Chézy, HV. *Handbuch für Reisende nach Mannheim, Heidelberg und Schwetzingen. Nach einem neuen Plane bearbeitete und berichtigte Ausgabe der "Gemälde von Mannheim."* Heidelberg: Engelmann, 1843: 146.

30. Donat, W. *Die Geschichte der Heidelberger Apotheken*. (Note 6) 1913: 65-196.

31. Friedrich, Christoph: Pharmazeuten rund um Goethe. *Pharmazeutische Zeitung* 1999; 41: 1-5.

32. Von Weech, F. and Krieger, A. Karl Peter Friedrich Landfried. In von Krieger, A. and Obser, K. (eds). *Badische Biographien*. Heidelberg: Im Auftrage der Badischen historischen Kommission, 1906: 506-507.

33. Von Weech, F. Alexander von Soiron. In Von Weech, F. (ed). *Badische Biographien*. Heidelberg: Verlag von Bassermann, 1875; 2: 301-303.

34. Seier, H. Elisabethkirche, Deutschordensgut und "Hoffmannsche Angelegenheit". In Arnold, U. and Liebing, H. (eds). *Elisabeth, der Deutsche Orden und ihre Kirche. Festschrift zur 700jährigen Wiederkehr der Weihe der Elisabethkirche*. Elvert, NG.: Verlag Marburg, 1983: 282-309.

35. Anonymous. *Protokoll der Deutschen Bundesversammlung*. Frankfurt: Andreäische Buchhandlung, 1817.

36. Seier, H. *Elisabethkirche, Deutschordensgut*. (Note 32) 1983: 282-309.

37. Seier, H. *Elisabethkirche, Deutschordensgut*. (Note 32) 1983: 282-309.

38. Rehn, Ludwig. Blasengeschwülste bei Fuchsinarbeitern. *Archiv für klinische Chirurgie* 1895; 50: 588-600.

39. Rehn, Ludwig. Ueber penetrirende Herzwunden und Herznaht. *Archiv für klinische Chirurgie,*1897; 55: 315-329.

40. Bartels, KH. and Loibl, W. *350 Jahre Marien-Apotheke Lohr am Main [1650-2000]: Beiträge zur Geschichte des Gesundheitswesens und zur Häusergeschichte in Lohr*. Lohr: Geschichts und Museumsverein, 2000: 34: 1-84.

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A special relationship: George Urdang (1882-1960) and his connections with the United Kingdom

Christiane Staiger

Abstract
In 1938 George Urdang left Germany and started a new life in the USA. As Director of the American Institute of the History of Pharmacy in Madison, Wisconsin, USA, he communicated with many scientists and partners across the Atlantic, several of them in the UK. This paper describes the correspondence and material held in the collection of the American Institute of the History of Pharmacy, Madison, WI, the Kremers Reference Files, UW-Madison School of Pharmacy, the Wellcome Library, London, UK, and discusses Urdang's relationship with the UK.

Zusammenfassung
1938 verließ Georg Urdang Deutschland und begann ein neues Leben in den USA. Als Direktor des American Institute of the History of Pharmacy in Madison, Wisconsin, USA, kommunizierte er mit vielen Wissenschaftlern und Partnern jenseits des Atlantik, darunter auch mehreren aus dem Vereinigten Königreich. Dieser Aufsatz beschreibt die im American Institute of the History of Pharmacy , Madison, WI, den Kremers Reference Files, UW-Madison School of Pharmacy, und der Wellcome Library, London, UK vorhandene Korrespondenz und bewertet anhand des Archivmaterials Urdangs Verhältnis mit dem Vereinigten Königreich.

Introduction

In the history of pharmacy the name of Georg(e) Urdang (Figure 1) is well known. He is remembered as one of the founders of the International Society for the History of Pharmacy and later became famous as the director of the American Institute of the History of Pharmacy (AIHP), in Madison, Wisconsin in the USA.[1, 2] In her PhD thesis Andrea Ludwig described the life and work of Urdang extensively and very well. However, she focused mainly on the developments and events in Germany and the USA in Urdang's lifetime. His connections with the UK have not been described in further detail.

Together with the AIHP, the Kremers Reference Files (KRF) at the UW-Madison, School of Pharmacy hold many letters addressed to or written by Urdang.[3] They cover mainly the 1940s and 1950s, but a small file with letters from 1936 is related to Urdang's search for a new professional perspective outside Germany. A part of the letters is related to partners in the UK. The content of this correspondence and material available in the KRF and at the Wellcome Library, London, give us an insight into Urdang's relationship with the UK.

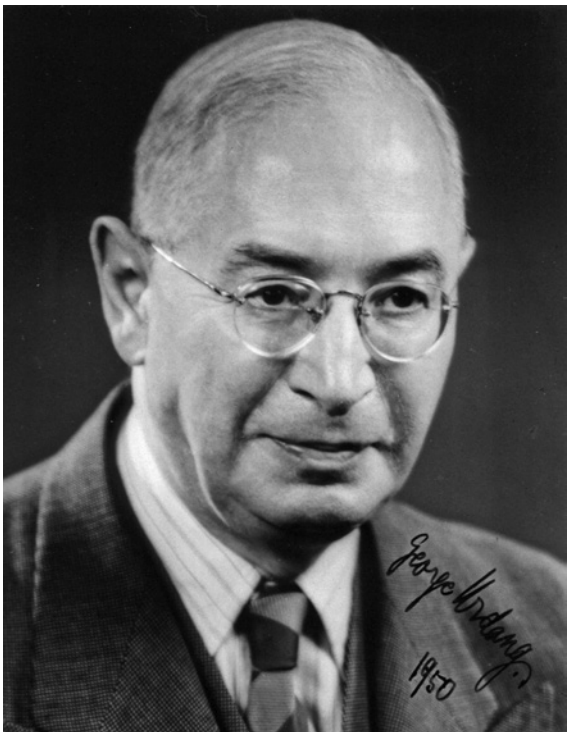

Figure 1. *George Urdang in 1950 (Source: http://resource.nlm.nih.gov/101430878)*

In search of a new life

Isidor Georg Urdang was born on 13 June 1882 in Tilsit, where he grew up and went to school.[4] In 1898, he entered into his career in pharmacy. In 1919, he became editor of the *Pharmazeutische Zeitung* in Berlin. In the early 1930s he obtained a PhD with the first German substantial history of pharmacy dissertation.[5] However, being Jewish, his life turned during the Third Reich. In 1936, he was removed from his editorial position.

Having no future in Germany, Urdang started to formulate his plans to emigrate. Thus, he addressed the Pharmaceutical Society of Great Britain (PSGB) in order to find out the conditions to register in GB or other British domains, in particular South Africa. On 29 August 1936 Urdang wrote a letter to the PSGB. In his response the Assistant Secretary F.W. Adams[6] stated:

> It is with great regret that I learn you have had to give up your employment and I shall be glad to give you any help I can, although I fear it will not be

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much. […] If you wish to obtain the British qualification, whether for the purpose of securing registration in a British domination or not, it will be necessary for you to pass our final examination. It is possible that the Council would agree to exempt you from the intermediate examination and the training requirements so that so far as the Society is concerned all obstacles in the way of you taking the examination would be removed, […] There is another possibility and that is that the South African Pharmacy Board would accept your qualification, making it unnecessary for you to qualify in this country and you may think it worth your while to write to the Board to enquire what their attitude is.[7]

Further to this, Adams added an address list of the boards in Northern Ireland, New Zealand, South Africa and all boards in Canada and Australia. Urdang turned to the South African Board in a letter dated 14 September 1936, but the response was quite simple:

> I beg to inform you that the qualification held by you will not entitle you to registration.[8]

So he got back in touch with the PSGB. On 10 October 1936 Adams explained:

> The Council considered your case at their meeting on Wednesday and I am pleased to say that they agreed to admit you to the […] Examination of the Society without complying with the requirements for training […] This means that you can enter for the qualifying examination at any time by paying the fees […], a total of sixteen guineas. No doubt you will need to spend some time in study over here before taking the examination, but any arrangement you make for this will be entirely at your own discretion.[9]

Urdang answered on 12 October, and in his letter from 17 October 1936 Adams became more concrete:

> I certainly think that you ought to spend at least half a year studying in England before taking the examination. It would be advisable for you to attend the full nine months course for the examination, which extends from October to June.[10]

It was obvious to Urdang that his German licence was far from being accepted right away in any other country. Not only the examination, but also parts of the education had to be repeated. His connections to Edward Kremers and the perspective to work in the history of Pharmacy contributed to Urdang's decision to cross the Atlantic towards the USA.

Figure 2. *Urdang's notebooks of courses taken at the Brooklyn College of Pharmacy. Kremers Reference Files, UW-Madison School of Pharmacy. (Source: photograph by Christiane Staiger)*

He arrived in New York on 30 May 1938 and did what was necessary to integrate quickly, like adding an 'e' to Georg(e).[11] Although being in his mid-fifties, he underwent some undergraduate education to meet the requirements for registration:

> I took the last year's course of the pharmaceutical curriculum at Brooklyn College of Pharmacy, passed the College Examination in May 1939 and the New York State Board one month later and am now an American Graduate in Pharmacy and a Registered New York Pharmacist, legally entitled to work in a New York drugstore for about $ 20.00 a week or to manage a drugstore on my own account.[12]

Starting at the American Institute of the History of Pharmacy (AIHP)

In July 1939 Urdang arrived in Madison, Wisconsin. His future was still uncertain. The foundation of the AIHP was yet to come in January 1941. But Urdang started his work in the history of pharmacy right away, and leveraged his name in the USA with several solid research publications. Together with Edward Kremers (1865-1941)[13] he published a history of pharmacy[14] as early as September 1940. The book includes a chapter on the development of pharmacy in Britain. In 1942, a book on the life of the German Swedish pharmacist Carl Wilhelm Scheele followed.[15]

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In 1944 another major opus was published, and it was concerned with the history of pharmacy in England: *Pharmacopoeia Londinensis of 1618. Reproduced in Facsimile. With a Historical Introduction by George Urdang*[16]. Urdang had studied this pharmacopoeia in extenso[17] and did not only describe and index the work, but analysed its background and impact carefully and scientifically.

Correspondence

The letters in the KRF cover several British addressees. Among them is a letter from Grete and Kurt Franken[…].[18] In January 1947, they thanked Gertrude and George Urdang very much for a parcel containing foodstuff and clothing, and added several private notes, some of them related to good memories from pre-Nazi times in Berlin. A further single letter refers to W. K. Fitch, Editor of the Pharmaceutical Journal.[19]

Urdang regularly sent his publications to friends and scientists in Europe. Among them were E. Ashworth Underwood (1899-1980),[20] Hugh Linstead (1901-1987),[21] Walter Pagel (1898-1983),[22] and Howard Bayles (1873?-1954).[23]

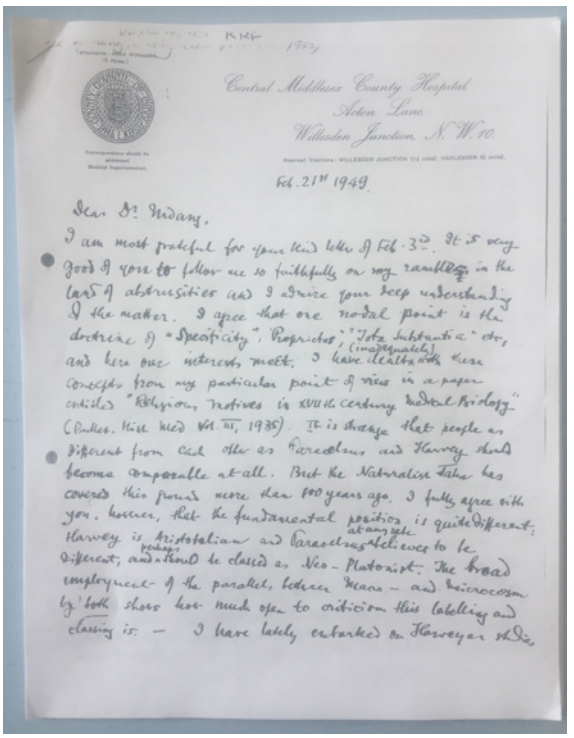
Correspondence with the latter between 1947 and 1951 is available in the KRF. Sixteen letters highlight the scientific discussion between Bayles and Urdang. In particular, Bayles sent sources, e.g. references and regulations, and furthermore assisted with detailed corrections to Urdang's publications. Urdang appreciated this exchange of knowledge and effort for perfection:

> I mean it literally when I say that I don't find the words to adequately express my gratitude and my admiration. There certainly is nobody in England (hence in the world!) who is so intimately familiar with the history of pharmacy and all its ramifications on the British Isles as you are, is accurate to an almost incredible degree and has, in addition to all this, been given by Providence the rarest gift of all: natural human kindness that has grown into the most helpful scholarly comradeship of which now I am the most grateful beneficiary. How fortune my readers will be who will profit from your help, from your being as you are.[24]

Some of the corrections were minor, but important:

> I agree with your statement concerning the necessity (and importance!) of deleting the comma between Burroughs and Wellcome. As a matter of fact, I agree with every correction and suggestion you have made.[24]

Also the correspondence with Walter Pagel, London, was scientifically orientated. Twelve letters written between September 1946 and May 1955 are available in the KRF, four of them are also stored in the archive of the Wellcome Library. The letters reflect the academic discourse (Figure 3). Although both were emigrants from Nazi Germany, all letters are written in English. Urdang remarked:


Central Middlesex County Hospital
Acton Lane
Willesden Junction, N.W.10.

Feb. 21st 1949

Dear Dr Urdang,

I am most grateful for your kind letter of Feb. 3rd. It is very good of you to follow me so faithfully on my ramblings in the land of abstrusities and I admire your deep understanding of the matter. I agree that one nodal point is the doctrine of "Specificity", "Proprieties", "Toxe substantiae" etc, and here our interests meet. I have dealt with these concepts from my particular point of view in a paper entitled "Religious motives in XVII th century Medical Biology" (Endeav. Vol. VII, 1948). It is strange that people as different from each other as Paracelsus and Harvey should become comparable at all. But the Naturalist Take has covered this ground more than 100 years ago. I fully agree with you, however, that the fundamental position is quite different: Harvey is Aristotelian and Paracelsus, as I believe to be different; and should be classed as Neo-Platonist. The broad emphasis of the parallel between Macro- and Microcosm by both shows how much open to criticism this labelling and classing is. — I have lately embarked on Harveyan studies

Figure 3. *Letter from Walter Pagel to Urdang, 21 February 1949, Kremers Reference Files, UW-Madison School of Pharmacy. (Source: photograph by Christiane Staiger)*

> About twenty years ago you wrote a very kind review on a German book of mine, *Der Apotheker als Subjekt und Objekt der Literatur.* Now we are exchanging views from England and U.S.A. respectively. Let me hope that we will do so for a long time and to our mutual advantage.[25]

The correspondence shows that Urdang inspired Pagel to study Paracelsus and they exchanged publications mutually. Besides scientific matters, the letters contain private issues like the daily workload or health. Urdang admitted in 1955:

> Unfortunately my state of health is not too good and I have to 'take it easy'. If people only would know how difficult it is to take it easy.[26]

Pagel responded with advice:

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> Yes, I agree, it is difficult 'to take it easy'. But it can be done (chiefly by avoiding lecturing and travelling!).[27]

The KRF only filed three letters from Hugh Linstead to Urdang. They cover the period of January 1947 to December 1955. The first is a thankyou for a publication Urdang has sent to him.[28] The second is a handwritten answer to Urdang's congratulations on the knighthood:

> You know us all so well! And how delighted you would have been, as a historian, at the old ceremony at the Palace when the Queen [Elizabeth II] gave us the accolade.[29]

As the salutation changed from 'my dear Dr Urdang' to 'my dear George' it is obvious the two men had further established their contact, most probably during Urdang's journey to Europe.

In 1950, Urdang followed an invitation from the German umbrella organisation of pharmacists to present the opening lecture of the 'Apothekertag' in Berlin. On his journey to Europe (20 June to 30 August) Urdang travelled to further conferences and visited Germany, France, and Switzerland. From there he went via Amsterdam to London, and then back to the USA. His travel expenses note that he stayed in London for ten days at the Hotel Athenum for $40.[30] Dr Ashworth Underwood, Director of the Wellcome Historical Medical Museum, invited him for a talk, lunch, and a tour of the museum during this stay.[31] Urdang reflected his journey in two publications.[32] Furthermore, his talk at the International Congress on the History of Pharmacy was published, and he highlighted the use of Anglo-American show glasses in a translated German article the same year.[33]

However, Urdang's contact with the Wellcome Historical Medical Museum dated back to the 1930s. The Wellcome archive filed eight letters between Urdang and L.W.G. Malcolm, Conservator of the museum at that time.[34] The correspondence relates to an article Urdang had written about the museum in the *Pharmazeutische Zeitung* in 1934.[35]

Honorary membership of the Pharmaceutical Society of Great Britain

On 28 May 1952 the Secretary of the Pharmaceutical Society of Great Britain sent Urdang a special letter (Figure 4):

> I have much pleasure in informing you that […] the Council of the Society at their last meeting elected you an honorary member. I am sending with this letter your Diploma of honorary membership.[36]

On the occasion of his 70th birthday Urdang received two congratulatory telegrams from London. The first read: 'Congratulations and best wishes to the prophet who looks backwards= Fitch='[37]; and the second read: 'Salve Georgius Urdang 1882 natus discipuli te salutant=Lothian et Adams=',[6, 38, 39] [Hello to George Urdang, born in 1882, your scholars greet you].

After the death of George Urdang on 27 June 1960, in Madison, Wisconsin, his wife and the American Institute of the History of Pharmacy received several let-

Figure 4. *Diploma of Honorary Membership PSGB. Urdang room, American Institute of the History of Pharmacy, Madison, WI. (Source: photograph by Christiane Staiger)*

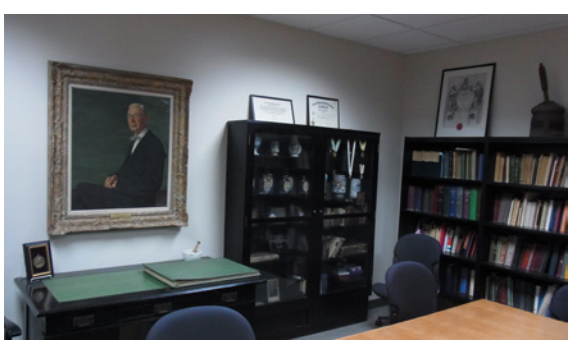

Figure 5. *'Urdang room' at the American Institute of the History of Pharmacy, Madison, WI. (Source: photograph by Christiane Staiger)*

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ter of condolences, among them ones from the Pharmaceutical Society of Great Britain and others in the United Kingdom.[40]

Conclusion

Urdang's scientific, professional and private relationships to the UK are reflected in letters kept in the KRF. In particular, he communicated regarding matters of scientific interest and research. He regularly sent his publications to institutions and friends in Europe. The example of George Urdang also shows how the uncertainty of the personal professional future affects emigration plans.

The recognition of his pharmacy skills was one of the key concerns for the determination of his destination. Although having good contacts within the UK, Urdang finally choose to immigrate into the United States and follow a career in the History of Pharmacy. His relationship with the United Kingdom was highlighted by the award of an honorary membership of the PSGB.

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Endnotes and References

1. Ludwig, A. *Georg Urdang (1882-1960). Ein Pharmaziehistoriker als Mittler zwischen "alter" und "neuer" Welt.* Stuttgart: Wissenschaftliche Verlagsgesellschaft mbH, 2009.

2. Sonnedecker, G. George Urdang in Madison: As I Remember Him. *Pharmacy in History.* 2001; 43: 59-65.

3. A2, Urdang, Georg. (Correspondence-1936), KRF.

4. The town is located on the south bank of the River Neman which was then in East Prussia; today it is known as Sovetsk and is located in Kaliningrad Oblast, Russia.

5. Urdang, G. *Zur Geschichte der Metalle in den amtlichen deutschen Arzneibüchern.* Mittenwald: Arthur Nemayer, 1933 (ipso facto PhD thesis, Halle).

6. Frederick William Adams (FWA) was an award winning student at the Society's school of pharmacy at Bloomsbury Square, London. He qualified as a chemist and druggist in 1921 and as a pharmaceutical chemist in 1922. Following a period as a demonstrator in chemistry at his alma mater, he was appointed Assistant Secretary of the Pharmaceutical Society of Great Britain (PSGB) in 1927. In 1942, he became Deputy Secretary and, in 1949 Secretary and Registrar, retiring in 1967. The same year FWA was awarded the Society's Charter Gold Medal. He was a barrister-at-law. FWA died, together with his second wife, in the Staines air disaster on 18 June 1972, aged 72. See Anonymous. Obituary F. W. Adams. *Pharmaceutical Journal.* 1972; 208: 565-566.

7. FW. Adams to Urdang, 3 September 1936, KRF. Ludwig [Note 1], p.39, states the letter of the PSGB was from Hugh Linstead. In fact, it was signed by FW. Adams, Assistant Secretary.

8. Registrar of the South African Pharmacy Board to Urdang. 16 October 1936, KRF.

9. FW. Adams to Urdang, 10 October 1936, KRF.

10. FW. Adams to Urdang, 17 October 1936, KRF.

11. On 2 December 1938 the University of the State of New York, and the State Board of Pharmacy issued a document to certify that Urdang was registered as an apprentice. This seems the first published evidence for his anglicised first name George. Ludwig [Note 1], p.51.

12. Urdang to P. Wolff, 19 September 1941, KRF, quoted after Ludwig [Note 1], p.51.

13. Edward Kremers, born on 23 February 1865, in Milwaukee, WI, child of German parents, studied pharmacy at the Philadelphia College of Pharmacy and the University of Wisconsin. He went into an academic career at the Department of Pharmacy in Madison and supported the history of pharmacy, the foundation of the AIHP and Urdang in many ways. He died on 9 July1941 from a heart attack.

14. Kremers, E. and Urdang, G. *History of Pharmacy - A Guide and a Survey.* Philadelphia/Toronto: Lippincott, 1940.

15. Urdang, G. *Pictorial Life History of the Apothecary-Chemist Carl Wilhelm Scheele.* Madison: AIHP and APhA, 1942.

15. *Pharmacopoeia Londinensis of 1618. Reproduced in Facsimile. With a Historical Introduction by George Urdang.* Hollister Pharmaceutical Library Number Two. State Historical Society of Wisconsin, Madison (Ed.) Milwaukee: Hammersmith-Kortmeyer, 1944.

17. Further publications on the subject include Urdang, G. *The Mystery about the First English (London) Pharmacopoeia.* Lecture Section History of Pharmacy of the APhA, Detroit Meeting August 20. Madison, WI: AIHP, 1941. Urdang, G. The Mystery about the First English (London) Pharmacopoeia of 1618. *Bull Hist Med.* 1942; 12: 304-313. Urdang, G. In 1618 British Pharmacists United. *American Druggist.* 1943; 108(Oct): 58, 154, 156. Urdang, G. Mystery of the First English Pharmacopoeia. *Journal of the American Pharmaceutical Association*, *Practical Pharmacy Edition.* 1946; 7: 76-81.

18. G. and K. Franken…[?handwriting not detectable] to Gertrude and G. Urdang, 22 January 1947, KRF.

19. Urdang to WK. Fitch, 30 August 1949, KRF.

20. E. A. Underwood was born on 9 March 1899. He obtained his medical education at the University of Glasgow. After holding positions in public health, he moved to London and increased his devotion to the history of medicine. In January 1946 he became Director of the Wellcome Historical Medical Museum and Library. He died on 6 March 1980. See Rowbotton, ME. Obituaries, Dr E. Ashworth Underwood (1899-1980). *Medical History.* 1980; 24: 349-352.

21. Hugh Nicholas Linstead (HL) was born on 3 February 1901 in Brighton, Sussex, as the son of a pharmacist. He followed his father's career and received his pharmaceutical education in London at the University of London and the Pharmaceutical Society's School as a Jacob Bell Scholar. He worked as the Sec-

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retary of the PSGB from 1926 to 1964, and became a Member of Parliament in 1942. From 1954 to 1966 he was President of the International Pharmaceutical Federation (FIP). He was knighted in 1953. See Biographical information filed by HL on 14 August 1959, for the AIHP, KRF. In 1965, Gloria Francke added the following to the section 'hobbies' of this document in her handwriting: 'Hockey when young. Excellent in sports.' Linstead died on 27 May 1987.

22. Walter Pagel was born on 12 November 1898 in Berlin, where he also studied medicine and obtained his doctorate. His particular interest in tuberculosis characterised his first professional steps. In 1933 he was forced to leave Germany and went to England. He operated as a pathologist at the Central Middlesex County Hospital, and spent the nights in research on the history of medicine in the early modern times. Paracelsus and William Harvey were the main areas of his research, which is also reflected in the letters to Urdang. Pagel died on 25 March 1983. See Müller-Jahncke, WD. In memoriam Walter Pagel (1989-1983). *Ber. Wiss. Gesch.* 1983; 6: 165-168.

23. Howard Bayles (HB) worked on the *Chemist and Druggist,* and was well known for producing good history articles. The 1911 census shows him as a lodger in London and a journalist. He was born around 1873 in Laxfield, Suffolk. Urdang's letters were addressed to Homestead, Lode Lane, Old Catton, Norwich. The deaths index shows an HB died in Norwich in December 1954, aged 82. Personal communication (email) from Ainley Wade, 5 April 2017.

24. Urdang to Howard Bayles, 31 July 1948, KRF.

25. Urdang to Walter Pagel, 25 September 1946, KRF.

26. Urdang to Walter Pagel, 20 February 1955, KRF, and WA/HMM/CO/Chr/G.35:Box127, Wellcome Collection.

27. Walter Pagel to Urdang, 9 April 1955, KRF.

28. Hugh Linstead to Urdang, 6 January 1947, KRF.

29. Hugh Linstead to Urdang, 8 July 1953, KRF.

30. Journey of the Director of the [AIHP] to Europe from June 20 to August 30. (Stay in Europe from 28 June to 23 August 1950). A2 Urdang, George, 21898702, KRF.

31. WA/HMM/CO/Chr/K.2:Box170, Wellcome Collection.

32. Urdang, G. A Visit to German Pharmacy. *Pharmaceutical Journal.* 1950; 166: 265-266. And Urdang, G. A Visit to German Pharmacy in 1950. *American Journal of Pharmacy Education.* 1950; 14: 571-577.

33. Urdang, G. How chemicals entered the official Pharmacopoeias. *Pharm. J.* 1951; 167: 301-306. And Urdang, G. Die Herkunft der englisch-amerikanischen Schaugläser. *Süddtsch. Apoth. Ztg.* 1950; 90: 555-556.

34. WA/HMM/CO/Chr/K.2:Box170. And PP/PAG/B/224:Box7, Wellcome Collection.

35. [Urdang, G.] Die Pharmazie im Wellcome Museum in London. *Pharm. Ztg.* 1934; 79: 214-217.

36. FW. Adams to Urdang, 28 May 1952, KRF.

37. WK. Fitch to Urdang, 12 June 1952, KRF.

38. Agnes Lothian and FW. Adams to Urdang, 14 June 1952, KRF.

39. Agnes Lothian (AL), FPS, was born in 1903. She undertook her pharmacy education at Heriot-Watt College, Edinburgh, and qualified in 1926. After working at the pharmacies of WH. Fowler at Redhill, Surrey, and Allen & Hanbury's in London, she was appointed librarian of the Pharmaceutical Society in 1940. Lothian formally qualified as a librarian, being elected an associate of the Library Association in 1944. She became a world authority on historical drug jars and mortars. In 1955 she was honoured by becoming the first female member of the Académie International d'Histoire de la Pharmacie (International Academy for the History of Pharmacy). In 1957 AL married GRA. Short, FPS. Lothian died on 13 October 1983. See Anonymous. Obituary. *Pharmaceutical Historian.* 1983; 13(4): 4.

40. Kenneth Fitch to Glenn Sonnedecker, 6 July 1960, and Robert Stauffer to Gertrude Urdang, 20 July 1960, KRF.

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